WORK PLAN
FOR
TREATMENT AND DISCHARGE OF DEWATERING LIQUIDS
FROM
PHASE II – PCB CONTAMINATED SOILS AND CONCRETE REMEDIATION
AT
NAVAL STATION NEWPORT
GOULD ISLAND
NEWPORT, RHODE ISLAND

Prepared For:

ENGINEERING FIELD ACTIVITY – NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
LESTER, PENNSYLVANIA 19113

Contract No. N62472-99-D-0032
Contract Task Order No. 0069

November 6, 2002

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
One Oxford Valley, Suite 200
LANGHORNE, PA 19047-1829

Revision	Date	Prepared by	Approved by	Pages Affected
0	November 6, 2002	J. Khouri	R. Woodworth	All

Prepare in quintuplicate (original and 4 copies)

CONTRACTOR DRAWINGS & INFORMATION SUBMITTAL CONTROL NO. 10

EFANENAVFACENGCOM 4335/3 (Rev. 6/80)

CONTRACT NO.	CONTRACT TASK ORDER NO.	ACTIVITY LOCATION
N62472-99-D-0032	**0069**	**Gould Island – Newport, RI**

PROJECT TITLE:
PCB Characterization and Removal – Gould Island

FROM:	DATE
Foster Wheeler Environmental Corp.: Program QC Manager Thomas Kelly	November 6, 2002
TO:	DATE
C. Davis (E-Copy)	November 6, 2002

1. THE CONTRACTOR SUBMITTALS LISTED BELOW ARE FORWARDED FOR YOUR REVIEW AND RECOMMENDATIONS.
(a) APPLY APPROPRIATE STAMP IMPRINT TO EACH SUBMITTAL AND INDICATE REVIEW COMMENTS, AS REQUIRED.
(b) RETAIN ONE (1) COPY OF THIS TRANSMITTAL FORM AND RETURN REMAINING COPIES WITH REVIEWED SUBMITTALS TO ROICC.
2. THESE SUBMITTALS SHOULD BE RETURNED TO THIS OFFICE BY _____
3. _____

E-COPY TO: **EFANE:** J. Rhyner
NEHC: D. Coons

HARD COPY TO: **NSNPT:** W. Monaco (4 copies plus 4 CD's of Submittal CTO-69-06 FIO)

☐ ROICC ☐ RPM ☐ CSO Thomas Joseph Kelly November 6, 2002
SIGNATURE AND DATE

FROM: DESIGNER	DATE
TO: ROICC	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE RETURNED, WITH ACTION TAKEN AS INDICATED.
2. _____

COPY TO:

☐ ROICC ☐ DESIGNER

SIGNATURE AND DATE

FROM: ROICC	DATE
TO: CONTRACTOR	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE APPROVED/DISAPPROVED AS SHOWN BELOW AND ON EACH STAMP IMPRINT.

COPY TO:
☐ ROICC ☐ OTHER

FOR COMMANDING OFFICER, ENGINEERING FIELD ACTIVITY NORTHEAST - NAVAL FACILITIES ENGINEERING COMMAND — DATE

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
1	SD-08, Statements; Work Plan for Treatment and Discharge of Dewatering Liquids from Phase II - PCB Contaminated Soils and Concrete Remediation – Gould Island	Thomas Kelly			

WORK PLAN FOR
TREATMENT AND DISCHARGE OF DEWATERING LIQUIDS FROM
PHASE II – PCB CONTAMINATED SOILS AND CONCRETE REMEDIATION
AT
NAVAL STATION NEWPORT, GOULD ISLAND
NEWPORT, RHODE ISLAND

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

Foster Wheeler Environmental Corporation (FWENC) has been contracted by the U.S. Navy Engineering Field Activity Northeast (EFANE) to provide remedial services at Gould Island, Naval Station Newport, Newport, Rhode Island. This Work Plan has been prepared to satisfy the requirements of Remedial Action Contract Number N62472-99-D-0032, Contract Task Order No. 0069 (CTO 69). This Work Plan addresses the treatment and discharge of dewatering liquids resulting from the remediation of PCB-contaminated soil and sediment associated with the Transformer Vaults on the Site. The transformer vaults are identified as Buildings 53, 54, 56, 60, and 61, and the switch house/transformer vault, Building 59.

Gould Island is located in the Narragansett Bay, approximately 1.5 miles from Naval Station Newport. The Site Layout is presented as *Figure 1*.

The Project Background and Objectives are presented in Section 2.0 of this Work Plan. Permitting requirements are discussed in Section 3.0. The Site Activities are described in Section 4.0. Field Sampling and Analysis is addressed in Section 5.0. Transportation and Disposal is addressed in Section 6.0.

2.0 PROJECT BACKGROUND AND OBJECTIVES

The work already performed at Gould Island consists of Delivery Order (DO) 044 (under RAC Contract No. N62472-94-D-0398), and CTO 029, CTO 047 and CTO 069 (under RAC Contract No. N62472-99-D-0032). DO 044 consisted of Phase I and Phase II. Phase I included asbestos abatement and hazardous waste removals. Phase II included demolition of selected buildings to the slab elevation only. Phase I and Phase II of DO 044 were completed in May 2001. In support of Phase II of DO 044, FWENC conducted concrete sampling of the interior floor and wall surfaces of the transformer vaults and the switch house. The results of that sampling indicated the presence of PCB contamination in some of the floor locations. Consequently, CTO 029 was created to perform Phase III, which involved crushing and removal of selected building slabs, foundations and concrete roadways. Due to the elevated levels of PCB contamination found at Building 54, CTO 047 was established to provide an interim removal action for Building 54.

CTO 069 was initiated in September 2001, and involved two phases of work. Phase I consisted of the development and implementation of a Sampling Plan to delineate the extent of PCB contamination on Gould Island. The Phase I Sampling Plan did not take into consideration data collected from previous site activities. Rather than using that previously collected data to confirm the extent of contamination, the Phase I Sampling Plan under CTO 069 was used to confirm the location of existing PCB contamination, and to determine the horizontal and vertical extents of the contamination.

Phase II of CTO 069 was performed during the summer of 2002, and consisted of remediation of PCB-contaminated soil and sediment associated with the Transformer Vaults to an interim clean up goal. The remedial activities resulted in the collection of approximately 40,000 gallons of dewatering liquids. The liquids are currently being stored on site in three (3) 21,000-gallon frac

tanks. This Work Plan describes the tasks planned for treatment and discharge of the dewatering liquids prior to the winter shutdown of site activities.

3.0 PERMITTING REQUIREMENTS

In order to obtain a permit equivalency from the Rhode Island Department of Environmental Management (RIDEM) to discharge the treatment system effluent to the Narragansett Bay, appropriate permit applications have been completed and appended to this Work Plan. *Appendix A* presents the *USEPA Form 1 Application: General Information - Consolidated Permits Program*. *Appendix B* presents the *USEPA Form 2C Application: Wastewater Discharge Information - Consolidated Permits Program.*

4.0 IMPLEMENTATION OF ON-SITE ACTIVITIES

4.1 Mobilization

FWENC personnel will include a Project Superintendent (PS), Site Engineer, Site Health and Safety Officer (SHSO), subcontract personnel and craft workers.

FWENC will utilize the existing office trailer at the Gould Island Site. All utilities at the work site will be temporary. Electricity will be provided by portable generators, and water will be obtained from the mainland and transported to the island via barge, if required. Sanitary facilities will be available at the FWENC office trailer.

Additionally, FWENC will mobilize all necessary equipment and materials required for the remedial tasks.

4.2 Treatment System

FWENC has utilized double-walled frac tanks to store the recovered liquids. The frac tanks contain a total of approximately 40,000 gallons of dewatering liquids. Two of the frac tanks (Frac Tanks 1 and 2) are currently staged on the Building 32 floor slab, and one frac tank (Frac Tank 3) is staged on gravel near the bulkhead. The frac tank locations are shown on *Figure 2*. Laboratory analytical results for samples of the frac tank contents are presented in *Appendix C.*

FWENC will mobilize a leased treatment system to the site, consisting of two (2) bag filters in series, followed by two (2) carbon adsorbers in series. The treatment system will be set up adjacent to the Frac Tanks 1 and 2, as shown on *Figure 2*. See *Figure 3* for a schematic diagram of the treatment system. See *Appendix D* for carbon usage calculations and an isotherm from the carbon vendor.

The discharge regulations for the contaminant of concern, Polychlorinated Biphenyls (PCBs), is 0.5 ppb at the discharge point. The Water Quality Regulations call for a .04 ppb of PCBs as the limit in Narrangansett Bay. This limit will be satisfied by using the CORMIX Model which is discussed in Section 4.3. When the treatment system is placed in operation, the initial effluent will be cycled back into one of the frac tanks for sampling, and the system will be temporarily

shut down. A sample will be collected and analyzed to certify that the effluent complies with the discharge limit. If the sample complies, system operation will resume and the treated effluent will be conveyed through a submerged multiport diffuser to the approved discharge point in Narragansett Bay (see *Figure 2*). Additional effluent samples will be collected when approximately half of the frac tank liquids have been treated, and at the end of the treatment batch, to ensure that the effluent continues to meet the discharge limit. If a sample indicates that the discharge exceeds the limit, the treatment system will be shut down immediately. The system will not be returned to operation until the problem has been corrected.

The flow rate of the treatment system will be 15 gallons per minute (GPM). The system will be operated for approximately four 10-hour days, to treat the entire contents of the frac tanks.

Following treatment and discharge of the liquids in Frac Tanks 1 and 2, a vacuum truck will be utilized to transfer the contents of Frac Tank 3 to one of the empty tanks, so that the contents can be treated without relocating the treatment system.

4.3 CORMIX Modeling

The CORMIX Model is an approved hydrodynamic mixing model used to show that the designed discharge pipe achieves the diluted number of .04 ppb. Foster Wheeler ran the CORMIX Model based on the following conditions:

- Foster Wheeler tested three (3) different ambient current conditions; stagnant (u=0 m/s), weak current (u=0.05m/s= 0.1 knot), mean current (u= 0.15m/s= 0.3 knots).
- The discharge would be at 24 ft of water at low tide (worst-case), approximately 140 ft from the shoreline. This distance will not be effective in stagnant conditions, and will be effective for weak and mean current cases only in the farfield region (region after the plume surfaces).
- Ambient water was assumed to be vertically mixed, that is, uniform density of water column at 1024 kg/m^3, based on NOAA PORTS measurements.
- Discharge concentration was 0.5 ppb, as it exists the port.
- Frac tank salinity of ~28 ppt was used for all the runs to reflect worst-case conditions (decreased buoyancy effects). This salinity corresponds to a discharge density of approximately 1018 kg/m^3 at temperatures of ~24C (see ESI Laboratory Report dated October 29, 2002 located in Appendix C).
- Single port (4 in diameter) discharge with port looking vertically upwards, alignment is perpendicular to ambient current (if any), and port is 1 ft above the bottom.
- Recommended (by CORMIX) wind speed of 2 m/s was used, which is not effective in the nearfield.
- Bottom friction coefficient, Manning's n=0.020.

RESULTS:

	Stagnant (u=0)	Weak Current (u= 0.05 m/s)	Mean Current (u= 0.15 m/s)
Near Field***** Dilution/ **Concentration (ppb)**	57.4 / **0.01 ppb** at the surface (<< 0.04 ppb)	454 / **0.0011 ppb** at the surface (<< 0.04 ppb)	1554 / **0.00032 ppb** at the surface (<< 0.04 ppb)
Far Field****** Dilution / Distance from Discharge (ft)	Not applicable since no current (nothing to transport the plume)	3155 / 0.00016 ppb (<< 0.04 ppb) when plume is attaches to shore (140 ft away)	34300 / 0.000015 ppb (<< 0.04 ppb) when plume is attaches to shore (140 ft away)

****** The region of a receiving water where the initial jet characteristics of momentum flux, buoyancy flux and outfall geometry influence the jet trajectory and mixing of an effluent discharge.*

******* The region of a receiving water where buoyant spreading motions and passive diffusion control the trajectory and dilution of the effluent discharge plume.*

Discussion of Results: Even with the stagnant conditions, the concentrations falls below the required limit with the worst-case conditions tested. Dilution increases significantly (as expected) with increasing current magnitude. Worst-case conditions include, but not limited to, stagnant and/or weak current conditions, higher discharge density which yields in decreased buoyant mixing, 24 ft of water column at low tide, etc. Also, note that only Frac tank #3 has a high salinity value (with higher density) and it has the smallest volume (5000 gallons) of effluent.

The results of the CORMIX Modeling are presented in Appendix E.

4.4 Equipment and Personnel Decontamination

Equipment and personnel will be thoroughly decontaminated in accordance with the Site-Specific Health and Safety Plan (SHSP) and the *Final Work Plan for Phase II – PCB Contaminated Soils and Concrete Remediation* (FWENC, August 2002). As a reference, a CD copy of the Final Work Plan is included with this document.

5.0 FIELD SAMPLING AND ANALYSIS

The tasks to be performed by FWENC at the Gould Island Site require field sampling and analytical data to ensure that the effluent meets the discharge limit of 0.5 ppb for PCBs. Samples of the treatment system effluent will be collected when the system is started, when half of the liquid has been treated, and when the entire volume has been treated.

For details regarding sampling procedures and laboratory data reporting, see Section 6.0 (Field Sampling and Analysis) of the *Final Work Plan for Phase II – PCB Contaminated Soils and Concrete Remediation* (FWENC, August 2002). As a reference, a CD copy of the Final Work Plan is included with this document.

TABLE 1 SAMPLING SUMMARY						
Media	**Analysis**	**Number of Samples**	**Preservation**	**Holding Time**	**Sample Containers**	**Frequency**
Aqueous Confirmatory Samples	PCB SW846 8082	3	Cool	Extract within 7 days; analyze within 40 days	1 Liter Amber	At system start-up, halfway point, and when entire volume has been treated

6.0 TRANSPORTATION AND DISPOSAL

Transportation and disposal activities will be performed in accordance with Section 9.0 of the *Final Work Plan for Phase II – PCB Contaminated Soils and Concrete Remediation* (FWENC, August 2002). As a reference, a CD copy of the Final Work Plan is included with this document.

FIGURES

SOURCES:

1. COMPASS ENGINEERING GROUP, LLC, SUBCONTRACT NUMBER 039174, "TEST LOCATIONS AS OF FEBRUARY 14, 2002", GOULD ISLAND, NEWPORT, RHODE ISLAND; NAD 1988 RHODE ISLAND, NAVD 1988, DRAWN: NBC, DATE: 2/14/02.
2. COMPASS ENGINEERING GROUP, LLC, "PROGRESS PRINT TEST AS OF 01-08-2002", GOULD ISLAND MANAGEMENT AREA, RHODE ISLAND DEPT. OF ENVIRONMENTAL MANAGEMENT, ASSUMED HORIZONTAL AND VERTICAL DATUM, PROJ. NO.: 2937, DWG. NO.: 2937WKS.DWG.
3. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D6.DWG, GOULD ISLAND VAULT 54 PROFILE ELEVATIONS, FILE DATE: 3/12/2002.
4. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D7.DWG, GOULD ISLAND ADDITIONAL TEST AS OF 3-7-2002, FILE DATE: 3/12/2002.
5. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D8.DWG, GOULD ISLAND BUILDING AND VAULTS, FILE DATE: 3/13/2002.

LEGEND:

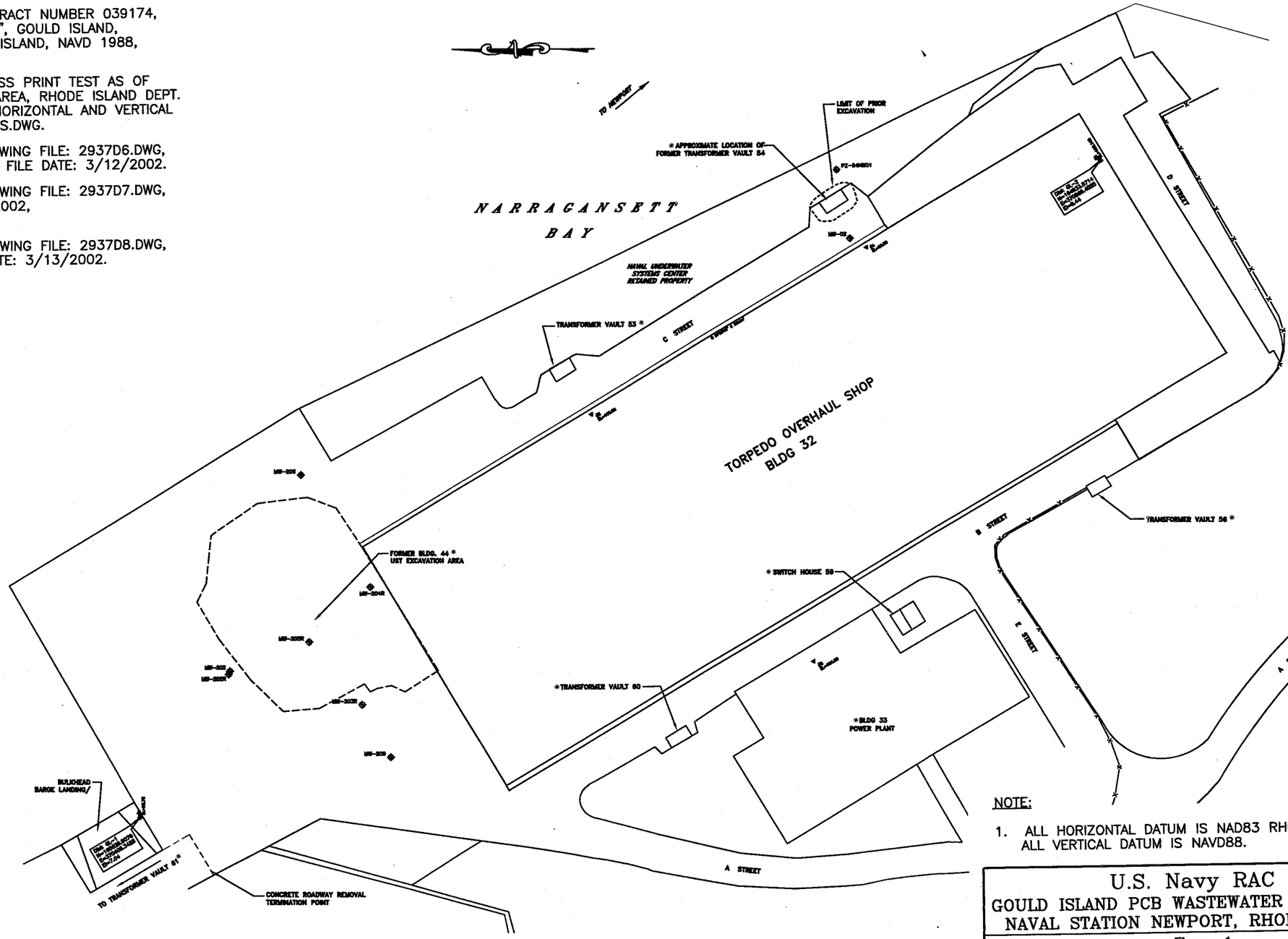
MW-02 ◆ MONITORING WELL
CASING ELEV. – 9.63
PVC ELEV. – 9.47
GROUND ELEV. – 7.6

MW-206 ◆ MONITORING WELL
CASING ELEV. – 7.25
PVC ELEV. – 6.96
GROUND ELEV. – 7.2

* BUILDING HAS BEEN DEMOLISHED

—x— FENCE

0 60 120
SCALE IN FEET



NOTE:

1. ALL HORIZONTAL DATUM IS NAD83 RHODE ISLAND; ALL VERTICAL DATUM IS NAVD88.

U.S. Navy RAC
GOULD ISLAND PCB WASTEWATER TREATMENT
NAVAL STATION NEWPORT, RHODE ISLAND

Figure 1
Site Layout

FOSTER WHEELER ENVIRONMENTAL CORPORATION

SOURCES:

1. COMPASS ENGINEERING GROUP, LLC, SUBCONTRACT NUMBER 039174, "TEST LOCATIONS AS OF FEBRUARY 14, 2002", GOULD ISLAND, NEWPORT, RHODE ISLAND; NAD 1988 RHODE ISLAND, NAVD 1988, DRAWN: NBC, DATE: 2/14/02.
2. COMPASS ENGINEERING GROUP, LLC, "PROGRESS PRINT TEST AS OF 01-08-2002", GOULD ISLAND MANAGEMENT AREA, RHODE ISLAND DEPT. OF ENVIRONMENTAL MANAGEMENT, ASSUMED HORIZONTAL AND VERTICAL DATUM, PROJ. NO.: 2937, DWG. NO.: 2937WKS.DWG.
3. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D6.DWG, GOULD ISLAND VAULT 54 PROFILE ELEVATIONS, FILE DATE: 3/12/2002.
4. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D7.DWG, GOULD ISLAND ADDITIONAL TEST AS OF 3-7-2002, FILE DATE: 3/12/2002.
5. COMPASS ENGINEERING GROUP, LLC, CAD DRAWING FILE: 2937D8.DWG, GOULD ISLAND BUILDING AND VAULTS, FILE DATE: 3/13/2002.

LEGEND:

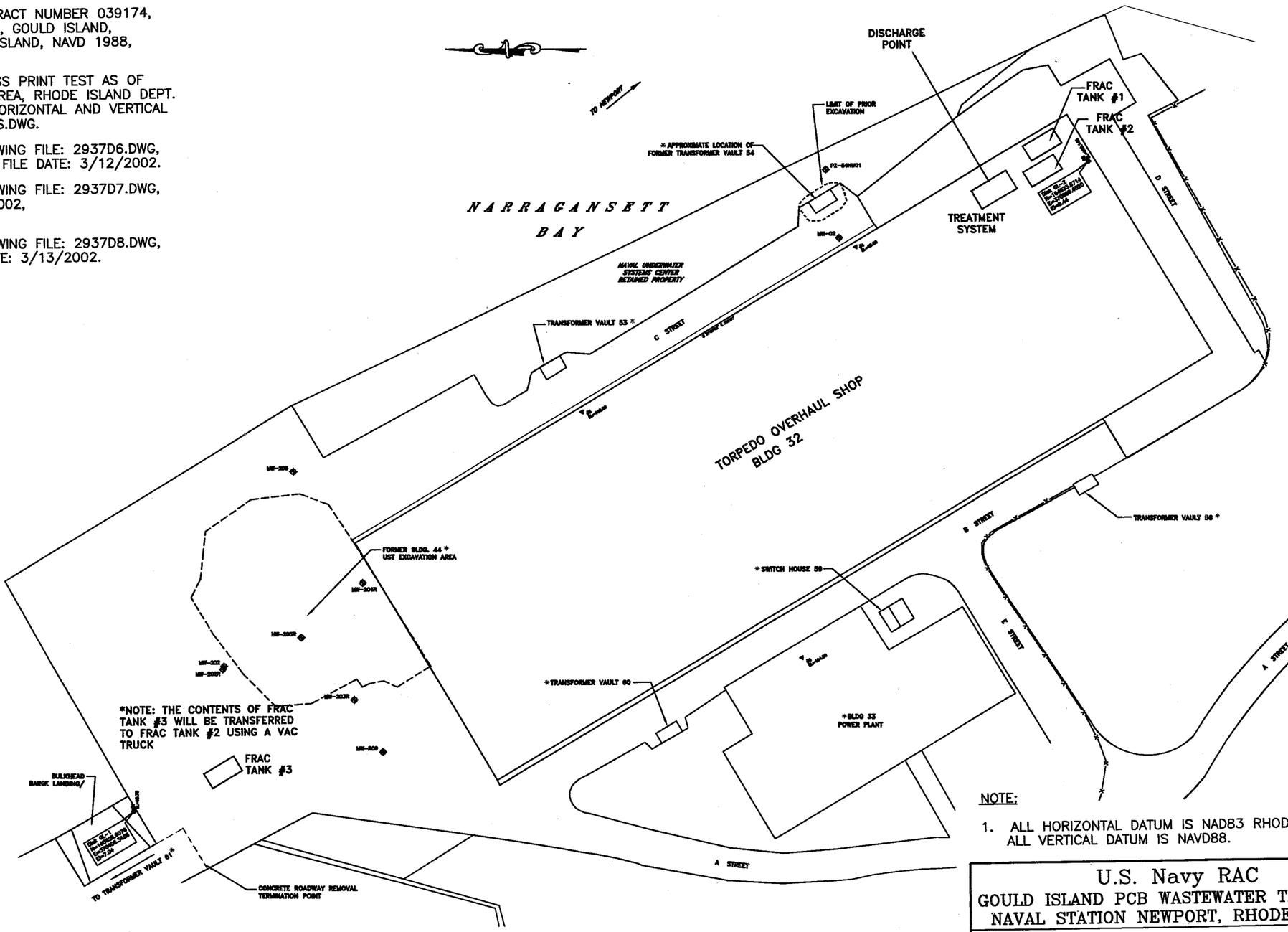
MW-02 ◆ MONITORING WELL
CASING ELEV. - 9.63
PVC ELEV. - 9.47
GROUND ELEV. - 7.6

MW-206 ◆ MONITORING WELL
CASING ELEV. - 7.25
PVC ELEV. - 6.96
GROUND ELEV. - 7.2

* BUILDING HAS BEEN DEMOLISHED

—x— FENCE

0 60 120
SCALE IN FEET



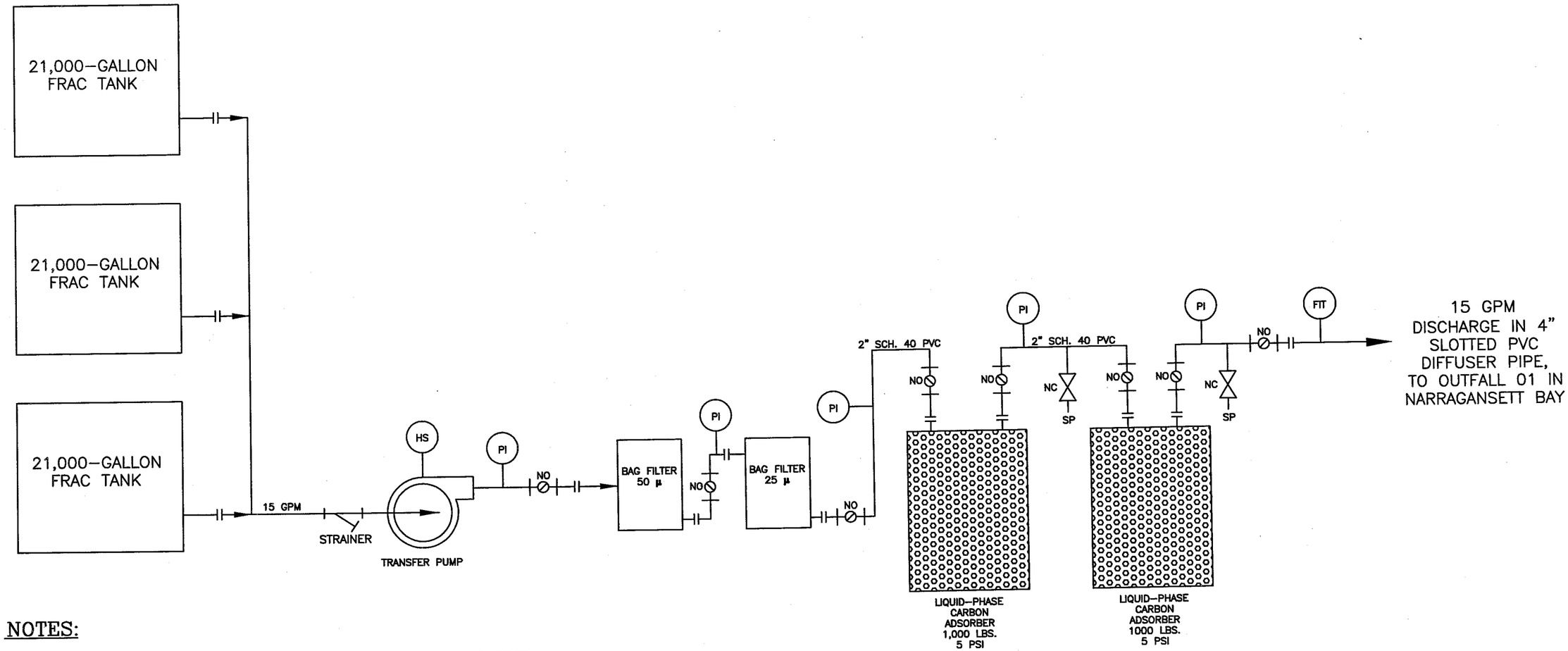
NOTE:

1. ALL HORIZONTAL DATUM IS NAD83 RHODE ISLAND; ALL VERTICAL DATUM IS NAVD88.

U.S. Navy RAC
GOULD ISLAND PCB WASTEWATER TREATMENT
NAVAL STATION NEWPORT, RHODE ISLAND

FIGURE 2
SITE LAYOUT DURING TREATMENT AND DISCHARGE

FOSTER WHEELER ENVIRONMENTAL CORPORATION



NOTES:

1. THIS SCHEMATIC FLOW DIAGRAM IS FOR SUBCONTRACTOR BIDDING PURPOSES ONLY. IT PROVIDES BIDDERS WITH THE MINIMUM REQUIREMENTS FOR THE FRAC TANK WATER TEMPORARY TREATMENT SYSTEM. BIDDER SHALL BE REQUIRED TO PROVIDE A FULLY OPERATIONAL SYSTEM INCLUDING ALL EQUIPMENT AND MATERIALS NECESSARY (INCUDING, BUT NOT LIMITED TO, PUMPS, PIPING, VALVES, INSTRUMENTATION, AND PROCESS EQUIPMENT).

2. THE FRAC TANKS HOLD APPROXIMATELY 40,000 GALLONS OF DEWATERING LIQUIDS RESULTING FROM THE EXCAVATION OF PCB–CONTAMINATED SOIL AND SEDIMENT AT THE SITE.

N.T.S.

LEGEND

- BALL VALVE
- GATE VALVE
- BLOWER
- NC NORMALLY CLOSED
- NO NORMALLY OPEN
- SP SAMPLE PORT
- LOCALLY MOUNTED INSTRUMENT

INSTRUMENT IDENTIFICATION

- HS HAND SWITCH
- PI PRESSURE INDICATOR
- FIT FLOW–INDICATING TOTALIZER

U.S. Navy RAC
GOULD ISLAND PCB WASTEWATER TREATMENT
NAVAL STATION NEWPORT, RHODE ISLAND

FIGURE 3
SCHEMATIC DIAGRAM OF TREATMENT SYSTEM

FOSTER WHEELER ENVIRONMENTAL CORPORATION

APPENDIX A

USEPA Form 1 Application:

General Information - Consolidated Permits Program

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge to waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: NAVAL STATION NEWPORT

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 MONACO WILLIAM WATER ENGINEER	401 841 6376

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 1 SIMONPIETRI

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 NEWPORT	RI	02841

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 690 PEARY STREET CODE N8N

B. COUNTY NAME

NEWPORT

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 NEWPORT	RI	02841	

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
9711 (specify) National Security	(specify)
C. THIRD	**D. FOURTH**
(specify)	(specify)

VIII. OPERATOR INFORMATION

A. NAME

NAVAL STATION NEWPORT

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)

F (specify)

D. PHONE (area code & no.) A 401 841 6376

E. STREET OR P.O. BOX

690 PEARY STREET

F. CITY OR TOWN

B NEWPORT

G. STATE RI

H. ZIP CODE 02841

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): 9 N R10020150	**D. PSD** (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): 9 U	**E. OTHER** (specify): 9 RI RI00177 (specify) Storm Water General Permit
C. RCRA (Hazardous Wastes): 9 R R1117002424 3	**E. OTHER** (specify): 9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

"Naval Station Newport is a Naval training facility. This permit application is for the discharge of approximately 40,000 gallons of treated water to the Narragansett Bay. The water was generated through dewatering excavations of PCB-contaminated soil and sediment on Gould Island. The water will be treated prior to discharge via filtration of particulates and carbon adsorption."

XIII. CERTIFICATION (see instructions)

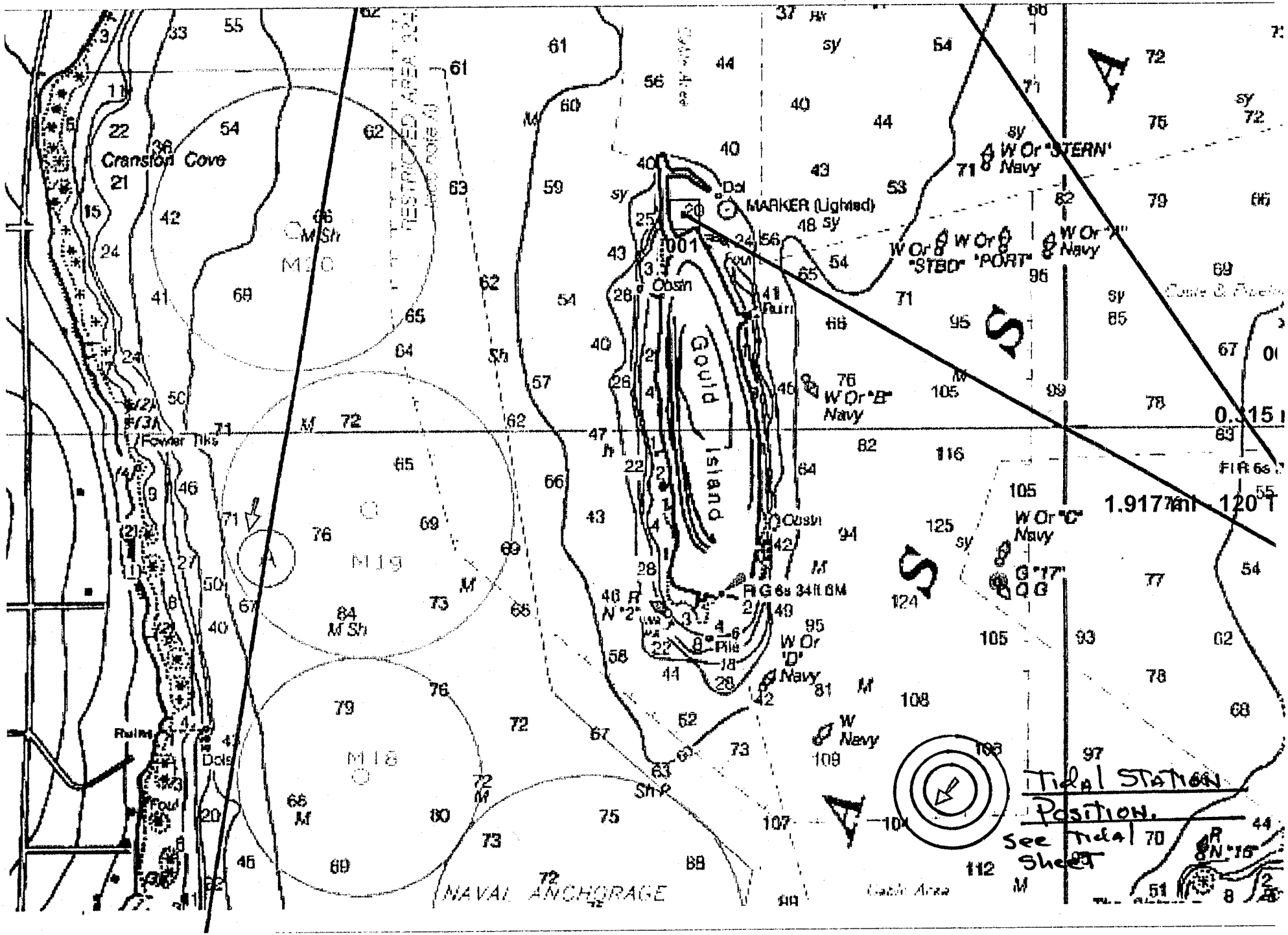
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED

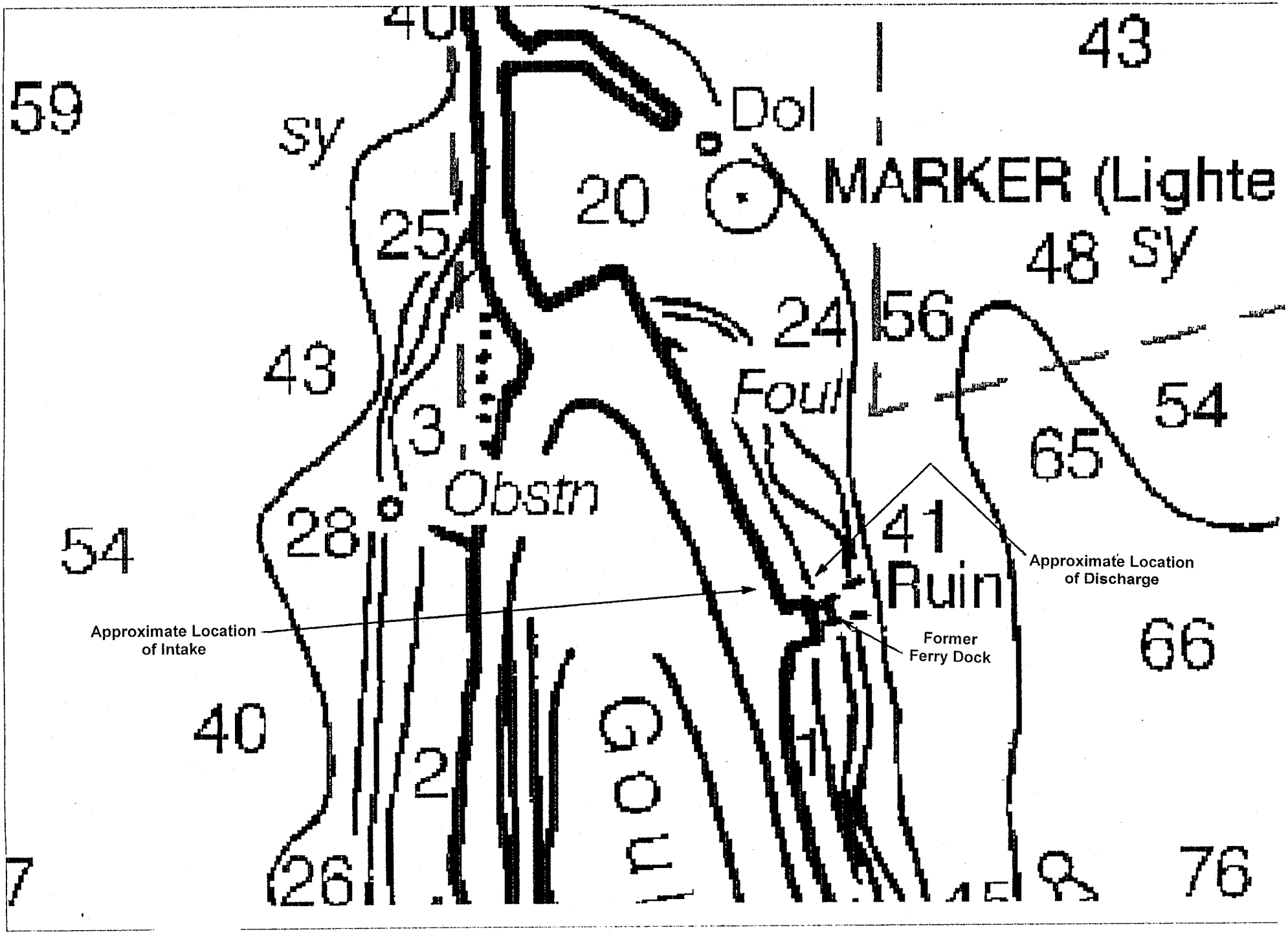
COMMENTS FOR OFFICIAL USE ONLY

C

Facility Location Map
Attachment 1



Facility Location Map
Attachment 1



APPENDIX B

USEPA Form 2C Application:

Wastewater Discharge Information - Consolidated Permits Program

Please print or type in the unshaded areas only.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*

Form Approved.
OMB No. 2040-0086.
Approval expires 8-31-98.

FORM 2C NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER *(list)*	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER *(name)*
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
01	41	32	.161N	71	20	.561W	Narragansett Bay

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. *(list)*	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION *(list)*	b. AVERAGE FLOW *(include units)*	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
01	Dewatering from excavation	25 gpm	Bag Filtration	XX	
	of PCB-contaminated soil		(50 u and 25 u);	XX	
	and sediment.		Liquid-phase carbon	2-A	
			adsorption (two 1000-lb		
			units in series)		

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ YES *(complete the following table)* ☒ NO *(go to Section III)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units)*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☐ YES *(complete Item III-B)* ☒ NO *(to to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ YES *(complete Item III-C)* ☐ NO *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES *(complete the following table)* ☒ NO *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. ☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*

CONTINUED FROM PAGE 2

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding — Complete one set of tables for each outfall — Annotate the outfall number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9. See explanation.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
N/A			

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☒ YES *(list all such pollutants below)* ☐ NO *(go to Item VI-B)*

Activities on Gould Island involve the use of diesel fuel for heavy equipment and gasoline for generators and pumps.

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES *(identify the test(s) and describe their purposes below)* ☒ NO *(go to Section VIII)*

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☒ YES *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ NO *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code & no.)*	D. POLLUTANTS ANALYZED *(list)*
Analytics Environmental Laboratory, LLC	195 Commerce Way, Suite E Portsmouth, NH 03801	(603)436-5111	See Tables V-A, V-B, and V-C

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE *(type or print)*	B. PHONE NO. *(area code & no.)*
C. SIGNATURE	D. DATE SIGNED

See Attachment 2 for explanation for Tables V-A, V-B, and V-C

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*

OUTFALL NO. 01

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*										NA	NA	0
b. Chemical Oxygen Demand *(COD)*										NA	NA	0
c. Total Organic Carbon *(TOC)*										NA	NA	0
d. Total Suspended Solids *(TSS)*								mg/L	kg	17.1	2.59	4
e. Ammonia *(as N)*										NA	NA	0
f. Flow	VALUE		VALUE		VALUE					VALUE 25GPM/40,000GAL		
g. Temperature *(winter)*	VALUE 10		VALUE		VALUE			°C		VALUE 10		
h. Temperature *(summer)*	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM				STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO. OF ANALYSES
a. Bromide (24959-67-9)												NA	NA	0
b. Chlorine, Total Residual												NA	NA	0
c. Color												NA	NA	0
d. Fecal Coliform												NA	NA	0
e. Fluoride (16984-48-8)												NA	NA	0
f. Nitrate–Nitrite *(as N)*												NA	NA	0

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)												NA	NA	0
h. Oil and Grease												NA	NA	0
i. Phosphorus (as P), Total (7723-14-0)												NA	NA	0
j. Radioactivity														
(1) Alpha, Total												NA	NA	0
(2) Beta, Total												NA	NA	0
(3) Radium, Total												NA	NA	0
(4) Radium 226, Total												NA	NA	0
k. Sulfate (as SO_4) (14808-79-8)												NA	NA	0
l. Sulfide (as S)												NA	NA	0
m. Sulfite (as SO_3) (14265-45-3)												NA	NA	0
n. Surfactants												NA	NA	0
o. Aluminum, Total (7429-90-5)												NA	NA	0
p. Barium, Total (7440-39-3)										mg/L	kg	0.27	0.0409	1
q. Boron, Total (7440-42-8)												NA	NA	0
r. Cobalt, Total (7440-48-4)												NA	NA	0
s. Iron, Total (7439-89-6)										mg/L	kg	0.75	0.114	4
t. Magnesium, Total (7439-95-4)												NA	NA	0
u. Molybdenum, Total (7439-98-7)												NA	NA	0
v. Manganese, Total (7439-96-5)												NA	NA	0
w. Tin, Total (7440-31-5)												NA	NA	0
x. Titanium, Total (7440-32-6)												NA	NA	0

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
	01

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE *(if available)* (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	c. LONG TERM AVRG. VALUE *(if available)* (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)													NA	NA	0
2M. Arsenic, Total (7440-38-2)											mg/L	g	<0.005	<0.787	1
3M. Beryllium, Total, 7440-41-7)													NA	NA	0
4M. Cadmium, Total (7440-43-9)											mg/L	g	0.00071B	0.107	1
5M. Chromium, Total (7440-47-3)											mg/L	g	<0.0015	<0.227	1
6M. Copper, Total (7440-50-8)													NA	NA	0
7M. Lead, Total (7439-92-1)											mg/L	g	<0.0029	<0.439	1
8M. Mercury, Total (7439-97-6)											mg/L	g	<0.00065	<.00984	1
9M. Nickel, Total (7440-02-0)													NA	NA	0
10M. Selenium, Total (7782-49-2)											mg/L	g	.0072B	1.09	1
11M. Silver, Total (7440-22-4)											mg/L	g	<0.0031	<0.469	1
12M. Thallium, Total (7440-28-0)													NA	NA	0
13M. Zinc, Total (7440-66-6)													NA	NA	0
14M. Cyanide, Total (57-12-5)													NA	NA	0
15M. Phenols, Total													NA	NA	0
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)				DESCRIBE RESULTS NA											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TEST-ING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)													NA	NA	0
2V. Acrylonitrile (107-13-1)													NA	NA	0
3V. Benzene (71-43-2)											ug/L	g	<10	<1.51	5
4V. Bis (Chloromethyl) Ether (542-88-1)													NA	NA	0
5V. Bromoform (75-25-2)											ug/L	g	<10	<1.51	5
6V. Carbon Tetrachloride (56-23-5)											ug/L	g	<10	<1.51	5
7V. Chlorobenzene (108-90-7)											ug/L	g	<10	<1.51	5
8V. Chlorodibromomethane (124-48-1)													NA	NA	0
9V. Chloroethane (75-00-3)											ug/L	g	<10	<1.51	5
10V. 2-Chloroethylvinyl Ether (110-75-8)													NA	NA	0
11V. Chloroform (67-66-3)											ug/L	g	<10	<1.51	5
12V. Dichlorobromomethane (75-27-4)													NA	NA	0
13V. Dichlorodifluoromethane (75-71-8)											ug/L	g	<10	<1.51	5
14V. 1,1-Dichloroethane (75-34-3)											ug/L	g	<10	<1.51	5
15V. 1,2-Dichloroethane (107-06-2)											ug/L	g	<10	<1.51	5
16V. 1,1-Dichloroethylene (75-35-4)											ug/L	g	<10	<1.51	5
17V. 1,2-Dichloropropane (78-87-5)											ug/L	g	<10	<1.51	5
18V. 1,3-Dichloropropylene (542-75-6)													NA	NA	0
19V. Ethylbenzene (100-41-4)											ug/L	g	<10	<1.51	5
20V. Methyl Bromide (74-83-9)													NA	NA	0
21V. Methyl Chloride (74-87-3)													NA	NA	0

CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (If available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (If available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (If available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)											ug/L	g	<25	<3.79	5
23V. 1,1,2,2-Tetrachloroethane (79-34-5)											ug/L	g	<10	<1.51	5
24V. Tetrachloroethylene (127-18-4)											ug/L	g	11.2	1.70	5
25V. Toluene (108-88-3)											ug/L	g	<10	<1.51	5
26V. 1,2-Trans-Dichloroethylene (156-60-5)											ug/L	g	<10	<1.51	5
27V. 1,1,1-Trichloroethane (71-55-6)											ug/L	g	4.4	0.67	5
28V. 1,1,2-Trichloroethane (79-00-5)											ug/L	g	<10	<1.51	5
29V. Trichloroethylene (79-01-6)											ug/L	g	<10	<1.51	5
30V. Trichlorofluoromethane (75-69-4)											ug/L	g	<10	<1.51	5
31V. Vinyl Chloride (75-01-4)											ug/L	g	<10	<1.51	5
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)											ug/L	g	<9	<1.36	5
2A. 2,4-Dichlorophenol (120-83-2)											ug/L	g	<9	<1.36	5
3A. 2,4-Dimethylphenol (105-67-9)											ug/L	g	<9	<1.36	5
4A. 4,6-Dinitro-O-Cresol (534-52-1)											ug/L	g	<9	<1.36	5
5A. 2,4-Dinitrophenol (51-28-5)											ug/L	g	<9	<1.36	5
6A. 2-Nitrophenol (88-75-5)											ug/L	g	<9	<1.36	5
7A. 4-Nitrophenol (100-02-7)											ug/L	g	<9	<1.36	5
8A. P-Chloro-M-Cresol (59-50-7)											ug/L	g	<19	<2.88	5
9A. Pentachlorophenol (87-86-5)											ug/L	g	<19	<2.88	5
10A. Phenol (108-95-2)											ug/L	g	<9	<1.36	5
11A. 2,4,6-Trichlorophenol (88-06-2)											ug/L	g	<9	<1.36	5

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (If available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (If available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (If available) (2) MASS	c. LONG TERM AVRG. VALUE (If available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (If available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)											ug/L	g	<4	<.606	5
2B. Acenaphtylene (208-96-8)											ug/L	g	<4	<.606	5
3B. Anthracene (120-12-7)											ug/L	g	<4	<.606	5
4B. Benzidine (92-87-5)											ug/L	g	<38	<5.75	5
5B. Benzo *(a)* Anthracene (56-55-3)											ug/L	g	<4	<.606	5
6B. Benzo *(a)* Pyrene (50-32-8)											ug/L	g	<4	<.606	5
7B. 3,4-Benzo-fluoranthene (205-99-2)											ug/L	g	<4	<.606	5
8B. Benzo *(ghi)* Perylene (191-24-2)											ug/L	g	<4	<.606	5
9B. Benzo *(k)* Fluoranthene (207-08-9)											ug/L	g	<4	<.606	5
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)											ug/L	g	<4	<.606	5
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)											ug/L	g	<4	<.606	5
12B. Bis *(2-Chloroiso-propyl)* Ether (102-60-1)											ug/L	g	<4	<.606	5
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)											ug/L	g	<4	<.606	5
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)											ug/L	g	<4	<.606	5
15B. Butyl Benzyl Phthalate (85-68-7)											ug/L	g	<4	<.606	5
16B. 2-Chloro-naphthalene (91-58-7)											ug/L	g	<4	<.606	5
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)											ug/L	g	<4	<.606	5
18B. Chrysene (218-01-9)											ug/L	g	<4	<.606	5
19B. Dibenzo *(a,h)* Anthracene (53-70-3)											ug/L	g	<4	<.606	5
20B. 1,2-Dichloro-benzene (95-50-1)											ug/L	g	<4	<.606	5
21B. 1,3-Dichloro-benzene (541-73-1)											ug/L	g	<4	<.606	5

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1,4-Dichlorobenzene (106-46-7)											ug/L	g	<4	<.606	5
23B. 3,3'-Dichlorobenzidine (91-94-1)											ug/L	g	<38	<5.75	5
24B. Diethyl Phthalate (84-66-2)											ug/L	g	<4	<.606	5
25B. Dimethyl Phthalate (131-11-3)											ug/L	g	<4	<.606	5
26B. Di-N-Butyl Phthalate (84-74-2)											ug/L	g	<4	<.606	5
27B. 2,4-Dinitrotoluene (121-14-2)											ug/L	g	<4	<.606	5
28B. 2,6-Dinitrotoluene (606-20-2)											ug/L	g	<4	<.606	5
29B. Di-N-Octyl Phthalate (117-84-0)											ug/L	g	<4	<.606	5
30B. 1,2-Diphenylhydrazine *(as Azobenzene)* (122-66-7)											ug/L	g	<4	<.606	5
31B. Fluoranthene (206-44-0)											ug/L	g	<4	<.606	5
32B. Fluorene (86-73-7)											ug/L	g	<4	<.606	5
33B. Hexachlorobenzene (118-74-1)											ug/L	g	<4	<.606	5
34B. Hexachlorobutadiene (87-68-3)											ug/L	g	<4	<.606	5
35B. Hexachlorocyclopentadiene (77-47-4)											ug/L	g	<4	<.606	5
36B. Hexachloroethane (67-72-1)											ug/L	g	<4	<.606	5
37B. Indeno *(1,2,3-cd)* Pyrene (193-39-5)											ug/L	g	<4	<.606	5
38B. Isophorone (78-59-1)											ug/L	g	<4	<.606	5
39B. Naphthalene (91-20-3)											ug/L	g	<4	<.606	5
40B. Nitrobenzene (98-95-3)											ug/L	g	<4	<.606	5
41B. N-Nitrosodimethylamine (62-75-9)											ug/L	g	<4	<.606	5
42B. N-Nitrosodi-N-Propylamine (621-64-7)											ug/L	g	<4	<.606	5

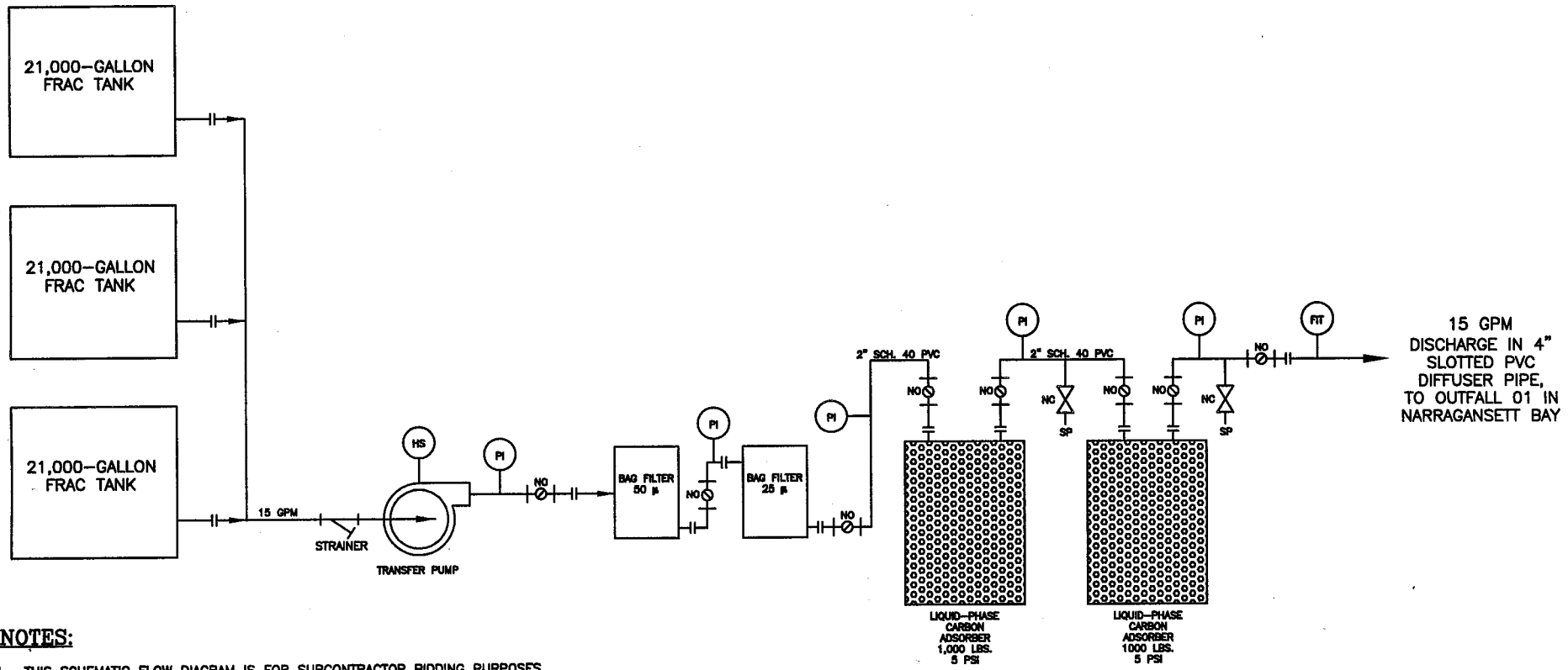
CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (If available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION -- BASE/NEUTRAL COMPOUNDS *(continued)*															
43B. N-Nitrosodiphenylamine (86-30-6)											ug/L	g	<4	<0.606	5
44B. Phenanthrene (85-01-8)											ug/L	g	<4	<0.606	5
45B. Pyrene (129-00-0)											ug/L	g	<4	<0.606	5
46B. 1,2,4 - Trichlorobenzene (120-82-1)											ug/L	g	21.8	3.30	5
GC/MS FRACTION -- PESTICIDES															
1P. Aldrin (309-00-2)													NA	NA	0
2P. α-BHC (319-84-6)													NA	NA	0
3P. β-BHC (319-85-7)													NA	NA	0
4P. γ-BHC (58-89-9)													NA	NA	0
5P. δ-BHC (319-86-8)													NA	NA	0
6P. Chlordane (57-74-9)													NA	NA	0
7P. 4,4'-DDT (50-29-3)													NA	NA	0
8P. 4,4'-DDE (72-55-9)													NA	NA	0
9P. 4,4'-DDD (72-54-8)													NA	NA	0
10P. Dieldrin (60-57-1)													NA	NA	0
11P. α-Endosulfan (115-29-7)													NA	NA	0
12P. β-Endosulfan (115-29-7)													NA	NA	0
13P. Endosulfan Sulfate (1031-07-8)													NA	NA	0
14P. Endrin (72-20-8)													NA	NA	0
15P. Endrin Aldehyde (7421-93-4)													NA	NA	0
16P. Heptachlor (76-44-8)													NA	NA	0

CONTINUED FROM PAGE V-8

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
	01

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION — PESTICIDES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)													NA	NA	0
18P. PCB-1242 (53469-21-9)											ug/L	g	<0.5	<0.076	5
19P. PCB-1254 (11097-69-1)											ug/L	g	<0.5	<0.076	5
20P. PCB-1221 (11104-28-2)											ug/L	g	<0.5	<0.076	5
21P. PCB-1232 (11141-16-5)											ug/L	g	<0.5	<0.076	5
22P. PCB-1248 (12672-29-6)											ug/L	g	<0.5	<0.076	5
23P. PCB-1260 (11096-82-5)											ug/L	g	3.96	0.600	5
24P. PCB-1016 (12674-11-2)											ug/L	g	<0.5	<0.076	5
25P. Toxaphene (8001-35-2)													NA	NA	0



NOTES:

1. THIS SCHEMATIC FLOW DIAGRAM IS FOR SUBCONTRACTOR BIDDING PURPOSES ONLY. IT PROVIDES BIDDERS WITH THE MINIMUM REQUIREMENTS FOR THE FRAC TANK WATER TEMPORARY TREATMENT SYSTEM. BIDDER SHALL BE REQUIRED TO PROVIDE A FULLY OPERATIONAL SYSTEM INCLUDING ALL EQUIPMENT AND MATERIALS NECESSARY (INCUDING, BUT NOT LIMITED TO, PUMPS, PIPING, VALVES, INSTRUMENTATION, AND PROCESS EQUIPMENT).

2. THE FRAC TANKS HOLD APPROXIMATELY 40,000 GALLONS OF DEWATERING LIQUIDS RESULTING FROM THE EXCAVATION OF PCB-CONTAMINATED SOIL AND SEDIMENT AT THE SITE.

N.T.S.

LEGEND

- BALL VALVE
- GATE VALVE
- BLOWER
- NC NORMALLY CLOSED
- NO NORMALLY OPEN
- SP SAMPLE PORT
- LOCALLY MOUNTED INSTRUMENT

INSTRUMENT IDENTIFICATION

- HS HAND SWITCH
- PI PRESSURE INDICATOR
- FIT FLOW-INDICATING TOTALIZER

U.S. Navy RAC
GOULD ISLAND PCB WASTEWATER TREATMENT
NAVAL STATION NEWPORT, RHODE ISLAND

FIGURE 3
SCHEMATIC DIAGRAM OF TREATMENT SYSTEM

FOSTER WHEELER ENVIRONMENTAL CORPORATION

I:\Projects\NAVYRAC\Gould Island\flow diagram.dwg, 11/06/2002 01:15:51 PM

Explanation for Tables V-A, V-B, and V-C:

Effluent characteristics are not currently available for the wastewater, since the treatment system has not been installed and operated. Laboratory analysis has been performed on samples of the intake (contents of the frac tanks) only. The analytical data has been inserted in the "Intake" sections of the tables. Effluent data will be provided when the system is installed and a "test run" is performed.

The discharge limit for the contaminant of concern, Polychlorinated Biphenyls (PCBs), is 0.5 ug/L. When the treatment system is placed in operation, the initial effluent will be cycled back into a frac tank for sampling, and the system will be temporarily shut down. A sample will be collected and analyzed to certify that the effluent complies with the discharge limit. If the sample complies, system operation will resume and the treated effluent will be conveyed through a submerged multiport diffuser to the approved discharge point in the Narragansett Bay. Additional effluent samples will be collected when approximately half of the frac tank liquids have been treated, and at the end of the treatment batch, to ensure that the effluent continues to meet the discharge limit. If a sample indicates that the discharge exceeds the limit, the treatment system will be shut down immediately. The system will not be returned to operation until the problem has been corrected.

APPENDIX C

Laboratory Analytical Results of Frac Tank Samples

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906
analytics@analyticslab.com

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200
Langhorne PA 19047

Report Number: 48502

Revision: Rev. 0

Re: GOULD ISLAND PCB REMEDIATION

CTO 69

Enclosed are the results of the analyses on your sample(s). Samples were received on 21 October 2002 and analyzed for the tests listed below. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.

Lab Number	Sample Date	Station Location	Analysis	Comments
48502-1	10/21/02	GIPII-FRAC1-WC1	EPA 8082 (PCBs only)	
	10/21/02	GIPII-FRAC1-WC1	EPA 8260 Volatile Organics	
	10/21/02	GIPII-FRAC1-WC1	EPA 8270 Acid/Base Neutrals	
	10/21/02	GIPII-FRAC1-WC1	Metals	
	10/21/02	GIPII-FRAC1-WC1	Metals Digestion	
	10/21/02	GIPII-FRAC1-WC1	Salinity	
	10/21/02	GIPII-FRAC1-WC1	Total Suspended Solids	
48502-2	10/21/02	GIPII-FRAC2-WC1	EPA 8082 (PCBs only)	
	10/21/02	GIPII-FRAC2-WC1	EPA 8260 Volatile Organics	
	10/21/02	GIPII-FRAC2-WC1	EPA 8270 Acid/Base Neutrals	
	10/21/02	GIPII-FRAC2-WC1	Metals	
	10/21/02	GIPII-FRAC2-WC1	Metals Digestion	
	10/21/02	GIPII-FRAC2-WC1	Salinity	
	10/21/02	GIPII-FRAC2-WC1	Total Suspended Solids	
48502-3	10/21/02	GIPII-FRAC3-WC1	EPA 8082 (PCBs only)	
	10/21/02	GIPII-FRAC3-WC1	EPA 8260 Volatile Organics	

Sample Receipt Exceptions: None

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, North Carolina and is validated by the U.S. Army Corps of Engineers (MRD) and U.S. Navy (NFESC). A list of actual certified parameters is available upon request.

If you have any further question on the analytical methods or these results, do not hesitate to call.

Authorized signature _____
Stephen L. Knollmeyer Lab. Director

Date 10/28/2002

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906
analytics@analyticslab.com

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200
Langhorne PA 19047

Report Number: 48502

Revision: Rev. 0

Re: GOULD ISLAND PCB REMEDIATION

CTO 69

Enclosed are the results of the analyses on your sample(s). Samples were received on 21 October 2002 and analyzed for the tests listed below. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.

Lab Number	Sample Date	Station Location	Analysis	Comments
	10/21/02	GIPII-FRAC3-WC1	EPA 8270 Acid/Base Neutrals	
	10/21/02	GIPII-FRAC3-WC1	Metals	
	10/21/02	GIPII-FRAC3-WC1	Metals Digestion	
	10/21/02	GIPII-FRAC3-WC1	Salinity	
	10/21/02	GIPII-FRAC3-WC1	Total Suspended Solids	
48502-4	10/21/02	Trip Blank	EPA 8260 Volatile Organics	

Sample Receipt Exceptions: None

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, North Carolina and is validated by the U.S. Army Corps of Engineers (MRD) and U.S. Navy (NFESC). A list of actual certified parameters is available upon request.

If you have any further question on the analytical methods or these results, do not hesitate to call.

Authorized signature _____
Stephen L. Knollmeyer Lab. Director

Date 10/28/2002

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC1-WC1

SAMPLE DATA

Lab Sample ID: 48502-1
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Quantitation Limit µg/L	Result µg/L	COMPOUND	Quantitation Limit µg/L	Result µg/L
Benzene	2	U	1,3-Dichloropropane	2	U
Bromobenzene	2	U	cis-1,3-Dichloropropene	2	U
Bromochloromethane	2	U	trans-1,3-Dichloropropene	2	U
Bromodichloromethane	2	U	2,2-Dichloropropane	2	U
Bromoform	2	U	1,1-Dichloropropene	2	U
Bromomethane	2	U	Ethylbenzene	2	U
n-butylbenzene	2	U	Hexachlorobutadiene	2	U
sec-butylbenzene	2	U	Isopropylbenzene	2	U
tert-butylbenzene	2	U	p-isopropyltoluene	2	U
Carbon Tetrachloride	2	U	Methylene Chloride	5	U
Chlorobenzene	2	U	Methyl-tert-butyl ether	2	U
Chloroethane	2	U	Naphthalene	2	U
Chloroform	2	U	n-Propylbenzene	2	U
Chloromethane	2	U	Styrene	2	U
2-Chlorotoluene	2	U	1,1,1,2-Tetrachloroethane	2	U
4-Chlorotoluene	2	U	1,1,2,2-Tetrachloroethane	2	U
Dibromochloromethane	2	U	Tetrachloroethene	2	14
1,2-Dibromo-3-chloropropane	2	U	Toluene	2	U
1,2-Dibromoethane	2	U	1,2,3-Trichlorobenzene	2	U
Dibromomethane	2	U	1,2,4-Trichlorobenzene	2	U
1,2-Dichlorobenzene	2	U	1,1,1-Trichloroethane	2	2
1,3-Dichlorobenzene	2	U	1,1,2-Trichloroethane	2	U
1,4-Dichlorobenzene	2	U	Trichloroethene	2	U
Dichlorodifluoromethane	2	U	Trichlorofluoromethane	2	U
1,1-Dichloroethane	2	U	1,2,3-Trichloropropane	2	U
1,2-Dichloroethane	2	U	1,2,4-Trimethylbenzene	2	U
1,1-Dichloroethene	2	U	1,3,5-Trimethylbenzene	2	U
cis-1,2-Dichloroethene	2	U	Vinyl Chloride	2	U
trans-1,2-Dichloroethene	2	U	o-Xylene	2	U
1,2-Dichloropropane	2	U	m,p-Xylene	2	U
Acetone	10	U	Diethyl ether	2	U
Carbon Disulfide	2	U	2-Hexanone	10	U
Tetrahydrofuran	5	U	Methyl isobutyl ketone	10	U
Methyl ethyl ketone	10	U	Di-isopropyl ether	2	U
t-Butyl alcohol	80	U	Ethyl t-butyl ether	2	U
t-Amyl methyl ether	2	U			

Surrogate Standard Recovery

d4-1,2-Dichloroethane	100 %	d8-Toluene	99 %	Bromofluorobenzene	86 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8260B.

COMMENTS:

8260 full

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC1-WC1

SAMPLE DATA

Lab Sample ID: 48502-1
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

ACID COMPOUND	Quantitation Limit µg/L	Result µg/L	ACID COMPOUND	Quantitation Limit µg/L	Result µg/L
2-Chlorophenol	5	U	Pentachlorophenol	10	U
4-Chloro-3-methylphenol	10	U	Phenol	5	U
2,4-Dichlorophenol	5	U	2,4,5-Trichlorophenol	5	U
2,4-Dimethylphenol	5	U	2,4,6-Trichlorophenol	5	U
2,4-dinitrophenol	5	U	Benzoic Acid	10	U
4,6-Dinitro-2-methylphenol	5	U	2-Methylphenol	5	U
2-Nitrophenol	5	U	3+4-Methylphenol	5	U
2,6-Dichlorophenol	5	U	Benzyl Alcohol	5	U
4-Nitrophenol	5	U	2,3,4,6-Tetrachlorophenol	5	U

Acid Surrogate Standard Recovery

2-Fluorophenol	31 %	d5-Phenol	25 %	2,4,6-Tribromophenol	54* %

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
1,2-Dichlorobenzene	2	U	Hexachlorobenzene	2	U
1,3-Dichlorobenzene	2	U	Benzidine	20	U
1,4-Dichlorobenzene	2	U	3,3'-Dichlorobenzidine	20	U
2,4-Dinitrotoluene	2	U	Azobenzene	2	U
2,6-Dinitrotoluene	2	U	Bis(2-chloroethoxy)methane	2	U
Nitrobenzene	2	U	bis(2-chloroethyl) ether	2	U
Hexachlorobutadiene	2	U	bis(2-chloroisopropyl)ether	2	U
Dimethyl Phthalate	2	U	4-bromophenyl phenyl ether	2	U
Di-n-butyl phthalate	2	U	Butyl benzyl phthalate	2	U
di-n-octyl-phthalate	2	U	4-Chlorophenyl phenyl ether	2	U
Bis (2-ethylhexyl) phthalate	2	U	Diethyl Phthalate	2	U
1,2,4-Trichlorobenzene	2	U	Hexachlorocyclopentadiene	2	U

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

Authorized signature

8270/625 layout

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name:	GOULD ISLAND PCB REMEDIATION
Project Number:	CTO 69
Field Sample ID:	GIPII-FRAC1-WC1

SAMPLE DATA

Lab Sample ID:	48502-1
Matrix:	Aqueous
Percent Solid:	N/A
Dilution Factor:	1.0
Collection Date:	10/21/02
Lab Receipt Date:	10/21/02
Extraction Date:	10/22/02
Analysis Date:	10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
Acenaphthene	2	U	N-nitrosodimethylamine	2	U
Acenaphthylene	2	U	N-nitroso-di-n-propylamine	2	U
Anthracene	2	U	n-nitrosodiphenylamine	2	U
Benzo[a]anthracene	2	U	Pyridine	2	U
Benzo[a] pyrene	2	U	2-Methylnaphthalene	2	U
Benzo[b] fluoranthene	2	U	2-Chloronaphthalene	2	U
Benzo[k] fluoranthene	2	U	Naphthalene	2	U
Benzo(g,h,i) perylene	2	U	Phenanthrene	2	U
Chrysene	2	U	Dibenzofuran	2	U
Dibenz [a,h] anthracene	2	U	Aniline	2	U
Fluoranthene	2	U	4-Chloroaniline	2	U
Fluorene	2	U	2-Nitroaniline	2	U
Indeno [1,2,3-cd] pyrene	2	U	3-Nitroaniline	2	U
Pyrene	2	U	4-Nitroaniline	2	U
Hexachloroethane	2	U	Carbazole	2	U
Isophorone	2	U			

Base Neutral Surrogate Standard Recovery

2-Fluorobiphenyl	56 %	d5-nitrobenzene	64 %	d14-p-terphenyl	64 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

COMMENTS: *Surrogate recovery outside laboratory acceptance criteria. Sample was reanalyzed to confirm results.

8270/625 layout

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 23, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION
Project Number: CTO 69

Field Sample ID: GIPII-FRAC1-WC1

SAMPLE DATA

Lab Sample ID: 48502-1
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/22/02

PCB ANALYTICAL RESULTS

COMPOUND	Quantitation Limit µg/L	Results µg/L
PCB-1016	0.5	U
PCB-1221	0.5	U
PCB-1232	0.5	U
PCB-1242	0.5	U
PCB-1248	0.5	U
PCB-1254	0.5	U
PCB-1260	0.5	2.6

Surrogate Standard Recovery

2,4,5,6-Tetrachloro-m-xylene	87	%
Decachlorobiphenyl	58	%

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

COMMENTS:

PCB Report

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2161
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC2-WC1

SAMPLE DATA

Lab Sample ID: 48502-2
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Quantitation Limit µg/L	Result µg/L	COMPOUND	Quantitation Limit µg/L	Result µg/L
Benzene	2	U	1,3-Dichloropropane	2	U
Bromobenzene	2	U	cis-1,3-Dichloropropene	2	U
Bromochloromethane	2	U	trans-1,3-Dichloropropene	2	U
Bromodichloromethane	2	U	2,2-Dichloropropane	2	U
Bromoform	2	U	1,1-Dichloropropene	2	U
Bromomethane	2	U	Ethylbenzene	2	U
n-butylbenzene	2	U	Hexachlorobutadiene	2	U
sec-butylbenzene	2	U	Isopropylbenzene	2	U
tert-butylbenzene	2	U	p-isopropyltoluene	2	U
Carbon Tetrachloride	2	U	Methylene Chloride	5	U
Chlorobenzene	2	U	Methyl-tert-butyl ether	2	U
Chloroethane	2	U	Naphthalene	2	U
Chloroform	2	U	n-Propylbenzene	2	U
Chloromethane	2	U	Styrene	2	U
2-Chlorotoluene	2	U	1,1,1,2-Tetrachloroethane	2	U
4-Chlorotoluene	2	U	1,1,2,2-Tetrachloroethane	2	U
Dibromochloromethane	2	U	Tetrachloroethene	2	13
1,2-Dibromo-3-chloropropane	2	U	Toluene	2	U
1,2-Dibromoethane	2	U	1,2,3-Trichlorobenzene	2	U
Dibromomethane	2	U	1,2,4-Trichlorobenzene	2	U
1,2-Dichlorobenzene	2	U	1,1,1-Trichloroethane	2	3
1,3-Dichlorobenzene	2	U	1,1,2-Trichloroethane	2	U
1,4-Dichlorobenzene	2	U	Trichloroethene	2	U
Dichlorodifluoromethane	2	U	Trichlorofluoromethane	2	U
1,1-Dichloroethane	2	U	1,2,3-Trichloropropane	2	U
1,2-Dichloroethane	2	U	1,2,4-Trimethylbenzene	2	U
1,1-Dichloroethene	2	U	1,3,5-Trimethylbenzene	2	U
cis-1,2-Dichloroethene	2	U	Vinyl Chloride	2	U
trans-1,2-Dichloroethene	2	U	o-Xylene	2	U
1,2-Dichloropropane	2	U	m,p-Xylene	2	U
Acetone	10	U	Diethyl ether	2	U
Carbon Disulfide	2	U	2-Hexanone	10	U
Tetrahydrofuran	5	U	Methyl isobutyl ketone	10	U
Methyl ethyl ketone	10	U	Di-isopropyl ether	2	U
t-Butyl alcohol	80	U	Ethyl t-butyl ether	2	U
t-Amyl methyl ether	2	U			

Surrogate Standard Recovery

d4-1,2-Dichloroethane	98 %	d8-Toluene	94 %	Bromofluorobenzene	96 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8260B.

COMMENTS:

8260 full

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC2-WC1

SAMPLE DATA

Lab Sample ID: 48502-2
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

ACID COMPOUND	Quantitation Limit µg/L	Result µg/L	ACID COMPOUND	Quantitation Limit µg/L	Result µg/L
2-Chlorophenol	5	U	Pentachlorophenol	10	U
4-Chloro-3-methylphenol	10	U	Phenol	5	U
2,4-Dichlorophenol	5	U	2,4,5-Trichlorophenol	5	U
2,4-Dimethylphenol	5	U	2,4,6-Trichlorophenol	5	U
2,4-dinitrophenol	5	U	Benzoic Acid	10	U
4,6-Dinitro-2-methylphenol	5	U	2-Methylphenol	5	U
2-Nitrophenol	5	U	3+4-Methylphenol	5	U
2,6-Dichlorophenol	5	U	Benzyl Alcohol	5	U
4-Nitrophenol	5	U	2,3,4,6-Tetrachlorophenol	5	U

Acid Surrogate Standard Recovery

2-Fluorophenol	35 %	d5-Phenol	25 %	2,4,6-Tribromophenol	65 %

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
1,2-Dichlorobenzene	2	U	Hexachlorobenzene	2	U
1,3-Dichlorobenzene	2	U	Benzidine	20	U
1,4-Dichlorobenzene	2	U	3,3'-Dichlorobenzidine	20	U
2,4-Dinitrotoluene	2	U	Azobenzene	2	U
2,6-Dinitrotoluene	2	U	Bis(2-chloroethoxy)methane	2	U
Nitrobenzene	2	U	bis(2-chloroethyl) ether	2	U
Hexachlorobutadiene	2	U	bis(2-chloroisopropyl)ether	2	U
Dimethyl Phthalate	2	U	4-bromophenyl phenyl ether	2	U
Di-n-butyl phthalate	2	U	Butyl benzyl phthalate	2	U
di-n-octyl-phthalate	2	U	4-Chlorophenyl phenyl ether	2	U
Bis (2-ethylhexyl) phthalate	2	5	Diethyl Phthalate	2	U
1,2,4-Trichlorobenzene	2	U	Hexachlorocyclopentadiene	2	U

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

Authorized signature

8270/625 layout

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 · Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name:	GOULD ISLAND PCB REMEDIATION
Project Number:	CTO 69
Field Sample ID:	GIPII-FRAC2-WC1

SAMPLE DATA

Lab Sample ID:	48502-2
Matrix:	Aqueous
Percent Solid:	N/A
Dilution Factor:	1.0
Collection Date:	10/21/02
Lab Receipt Date:	10/21/02
Extraction Date:	10/22/02
Analysis Date:	10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
Acenaphthene	2	U	N-nitrosodimethylamine	2	U
Acenaphthylene	2	U	N-nitroso-di-n-propylamine	2	U
Anthracene	2	U	n-nitrosodiphenylamine	2	U
Benzo[a]anthracene	2	U	Pyridine	2	U
Benzo[a] pyrene	2	U	2-Methylnaphthalene	2	U
Benzo[b] fluoranthene	2	U	2-Chloronaphthalene	2	U
Benzo[k] fluoranthene	2	U	Naphthalene	2	U
Benzo(g,h,i) perylene	2	U	Phenanthrene	2	U
Chrysene	2	U	Dibenzofuran	2	U
Dibenz [a,h] anthracene	2	U	Aniline	2	U
Fluoranthene	2	U	4-Chloroaniline	2	U
Fluorene	2	U	2-Nitroaniline	2	U
Indeno [1,2,3-cd] pyrene	2	U	3-Nitroaniline	2	U
Pyrene	2	U	4-Nitroaniline	2	U
Hexachloroethane	2	U	Carbazole	2	U
Isophorone	2	U			

Base Neutral Surrogate Standard Recovery

2-Fluorobiphenyl	60	%	d5-nitrobenzene	68	%	d14-p-terphenyl	66 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

COMMENTS:

8270/625 layout

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 23, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION
Project Number: CTO 69

Field Sample ID: GIPII-FRAC2-WC1

SAMPLE DATA

Lab Sample ID: 48502-2
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/22/02

PCB ANALYTICAL RESULTS

COMPOUND	Quantitation Limit µg/L	Results µg/L
PCB-1016	0.5	U
PCB-1221	0.5	U
PCB-1232	0.5	U
PCB-1242	0.5	U
PCB-1248	0.5	U
PCB-1254	0.5	U
PCB-1260	0.5	1.4

Surrogate Standard Recovery

2,4,5,6-Tetrachloro-m-xylene	40*	%
Decachlorobiphenyl	24*	%.

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

COMMENTS: *Surrogate recovery affected by sample matrix. Sample was reanalyzed to confirm results.

PCB Report

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC3-WC1

SAMPLE DATA

Lab Sample ID: 48502-3
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Quantitation Limit µg/L	Result µg/L	COMPOUND	Quantitation Limit µg/L	Result µg/L
Benzene	2	U	1,3-Dichloropropane	2	U
Bromobenzene	2	U	cis-1,3-Dichloropropene	2	U
Bromochloromethane	2	U	trans-1,3-Dichloropropene	2	U
Bromodichloromethane	2	U	2,2-Dichloropropane	2	U
Bromoform	2	U	1,1-Dichloropropene	2	U
Bromomethane	2	U	Ethylbenzene	2	U
n-butylbenzene	2	U	Hexachlorobutadiene	2	U
sec-butylbenzene	2	U	Isopropylbenzene	2	U
tert-butylbenzene	2	U	p-isopropyltoluene	2	U
Carbon Tetrachloride	2	U	Methylene Chloride	5	U
Chlorobenzene	2	U	Methyl-tert-butyl ether	2	U
Chloroethane	2	U	Naphthalene	2	U
Chloroform	2	U	n-Propylbenzene	2	U
Chloromethane	2	U	Styrene	2	U
2-Chlorotoluene	2	U	1,1,1,2-Tetrachloroethane	2	U
4-Chlorotoluene	2	U	1,1,2,2-Tetrachloroethane	2	U
Dibromochloromethane	2	U	Tetrachloroethene	2	U
1,2-Dibromo-3-chloropropane	2	U	Toluene	2	U
1,2-Dibromoethane	2	U	1,2,3-Trichlorobenzene	2	U
Dibromomethane	2	U	1,2,4-Trichlorobenzene	2	2
1,2-Dichlorobenzene	2	U	1,1,1-Trichloroethane	2	U
1,3-Dichlorobenzene	2	U	1,1,2-Trichloroethane	2	U
1,4-Dichlorobenzene	2	U	Trichloroethene	2	U
Dichlorodifluoromethane	2	U	Trichlorofluoromethane	2	U
1,1-Dichloroethane	2	U	1,2,3-Trichloropropane	2	U
1,2-Dichloroethane	2	U	1,2,4-Trimethylbenzene	2	U
1,1-Dichloroethene	2	U	1,3,5-Trimethylbenzene	2	U
cis-1,2-Dichloroethene	2	U	Vinyl Chloride	2	U
trans-1,2-Dichloroethene	2	U	o-Xylene	2	U
1,2-Dichloropropane	2	U	m,p-Xylene	2	U
Acetone	10	U	Diethyl ether	2	U
Carbon Disulfide	2	U	2-Hexanone	10	U
Tetrahydrofuran	5	U	Methyl isobutyl ketone	10	U
Methyl ethyl ketone	10	U	Di-isopropyl ether	2	U
t-Butyl alcohol	80	U	Ethyl t-butyl ether	2	U
t-Amyl methyl ether	2	U			

Surrogate Standard Recovery

d4-1,2-Dichloroethane	101 %	d8-Toluene	99 %	Bromofluorobenzene	97 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8260B.

COMMENTS:

8260 full

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: GIPII-FRAC3-WC1

SAMPLE DATA

Lab Sample ID: 48502-3
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

ACID COMPOUND	Quantitation Limit µg/L	Result µg/L	ACID COMPOUND	Quantitation Limit µg/L	Result µg/L
2-Chlorophenol	5	U	Pentachlorophenol	10	U
4-Chloro-3-methylphenol	10	U	Phenol	5	U
2,4-Dichlorophenol	5	U	2,4,5-Trichlorophenol	5	U
2,4-Dimethylphenol	5	U	2,4,6-Trichlorophenol	5	U
2,4-dinitrophenol	5	U	Benzoic Acid	10	U
4,6-Dinitro-2-methylphenol	5	U	2-Methylphenol	5	U
2-Nitrophenol	5	U	3+4-Methylphenol	5	U
2,6-Dichlorophenol	5	U	Benzyl Alcohol	5	U
4-Nitrophenol	5	U	2,3,4,6-Tetrachlorophenol	5	U

Acid Surrogate Standard Recovery

2-Fluorophenol	6 * %	d5-Phenol	15 * %	2,4,6-Tribromophenol	30* %

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
1,2-Dichlorobenzene	2	U	Hexachlorobenzene	2	U
1,3-Dichlorobenzene	2	U	Benzidine	20	U
1,4-Dichlorobenzene	2	U	3,3'-Dichlorobenzidine	20	U
2,4-Dinitrotoluene	2	U	Azobenzene	2	U
2,6-Dinitrotoluene	2	U	Bis(2-chloroethoxy)methane	2	U
Nitrobenzene	2	U	bis(2-chloroethyl) ether	2	U
Hexachlorobutadiene	2	U	bis(2-chloroisopropyl)ether	2	U
Dimethyl Phthalate	2	U	4-bromophenyl phenyl ether	2	U
Di-n-butyl phthalate	2	U	Butyl benzyl phthalate	2	U
di-n-octyl-phthalate	2	U	4-Chlorophenyl phenyl ether	2	U
Bis (2-ethylhexyl) phthalate	2	U	Diethyl Phthalate	2	U
1,2,4-Trichlorobenzene	2	1 J	Hexachlorocyclopentadiene	2	U

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

Authorized signature

8270/625 layout

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford-
Valley, Suite 200

October 24, 2002

CLIENT SAMPLE ID

Project Name:	GOULD ISLAND PCB REMEDIATION
Project Number:	CTO 69
Field Sample ID:	GIPII-FRAC3-WC1

SAMPLE DATA

Lab Sample ID:	48502-3
Matrix:	Aqueous
Percent Solid:	N/A
Dilution Factor:	1.0
Collection Date:	10/21/02
Lab Receipt Date:	10/21/02
Extraction Date:	10/22/02
Analysis Date:	10/23/02

ANALYTICAL RESULTS SEMI-VOLATILE ORGANICS

BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L	BASE NEUTRAL COMPOUND	Quantitation Limit µg/L	Result µg/L
Acenaphthene	2	U	N-nitrosodimethylamine	2	U
Acenaphthylene	2	U	N-nitroso-di-n-propylamine	2	U
Anthracene	2	U	n-nitrosodiphenylamine	2	U
Benzo[a]anthracene	2	U	Pyridine	2	U
Benzo[a] pyrene	2	U	2-Methylnaphthalene	2	U
Benzo[b] fluoranthene	2	U	2-Chloronaphthalene	2	U
Benzo[k] fluoranthene	2	U	Naphthalene	2	U
Benzo(g,h,i) perylene	2	U	Phenanthrene	2	U
Chrysene	2	U	Dibenzofuran	2	U
Dibenz [a,h] anthracene	2	U	Aniline	2	U
Fluoranthene	2	U	4-Chloroaniline	2	U
Fluorene	2	U	2-Nitroaniline	2	U
Indeno [1,2,3-cd] pyrene	2	U	3-Nitroaniline	2	U
Pyrene	2	U	4-Nitroaniline	2	U
Hexachloroethane	2	U	Carbazole	2	U
Isophorone	2	U			

Base Neutral Surrogate Standard Recovery

2-Fluorobiphenyl	57	%	d5-nitrobenzene	69	%	d14-p-terphenyl	66 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8270C.

COMMENTS: *Surrogate recovery outside laboratory acceptance criteria. Sample was reanalyzed to confirm results.

8270/625 layout

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 23, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION
Project Number: CTO 69

Field Sample ID: GIPII-FRAC3-WC1

SAMPLE DATA

Lab Sample ID: 48502-3
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Extraction Date: 10/22/02
Analysis Date: 10/22/02

PCB ANALYTICAL RESULTS

COMPOUND	Quantitation Limit µg/L	Results µg/L
PCB-1016	0.5	U
PCB-1221	0.5	U
PCB-1232	0.5	U
PCB-1242	0.5	U
PCB-1248	0.5	U
PCB-1254	0.5	U
PCB-1260	0.5	3.9

Surrogate Standard Recovery

2,4,5,6-Tetrachloro-m-xylene	76	%
Decachlorobiphenyl	52	%

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis conducted according to Test Methods for Evaluating Solid Waste, SW-846 Method 8082.

COMMENTS:

PCB Report

Authorized signature

analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906

Mr. Rick Woodworth
Foster Wheeler Environmental Corp.
2300 Lincoln Highway East One Oxford Valley,
Suite 200
Langhorne PA 19047

October 24, 2002

CLIENT SAMPLE ID

Project Name: GOULD ISLAND PCB REMEDIATION

Project Number: CTO 69

Field Sample ID: Trip Blank

SAMPLE DATA

Lab Sample ID: 48502-4
Matrix: Aqueous
Percent Solid: N/A
Dilution Factor: 1.0
Collection Date: 10/21/02
Lab Receipt Date: 10/21/02
Analysis Date: 10/23/02

ANALYTICAL RESULTS VOLATILE ORGANICS

COMPOUND	Quantitation Limit µg/L	Result µg/L	COMPOUND	Quantitation Limit µg/L	Result µg/L
Benzene	2	U	1,3-Dichloropropane	2	U
Bromobenzene	2	U	cis-1,3-Dichloropropene	2	U
Bromochloromethane	2	U	trans-1,3-Dichloropropene	2	U
Bromodichloromethane	2	U	2,2-Dichloropropane	2	U
Bromoform	2	U	1,1-Dichloropropene	2	U
Bromomethane	2	U	Ethylbenzene	2	U
n-butylbenzene	2	U	Hexachlorobutadiene	2	U
sec-butylbenzene	2	U	Isopropylbenzene	2	U
tert-butylbenzene	2	U	p-isopropyltoluene	2	U
Carbon Tetrachloride	2	U	Methylene Chloride	5	U
Chlorobenzene	2	U	Methyl-tert-butyl ether	2	U
Chloroethane	2	U	Naphthalene	2	U
Chloroform	2	U	n-Propylbenzene	2	U
Chloromethane	2	U	Styrene	2	U
2-Chlorotoluene	2	U	1,1,1,2-Tetrachloroethane	2	U
4-Chlorotoluene	2	U	1,1,2,2-Tetrachloroethane	2	U
Dibromochloromethane	2	U	Tetrachloroethene	2	U
1,2-Dibromo-3-chloropropane	2	U	Toluene	2	U
1,2-Dibromoethane	2	U	1,2,3-Trichlorobenzene	2	U
Dibromomethane	2	U	1,2,4-Trichlorobenzene	2	U
1,2-Dichlorobenzene	2	U	1,1,1-Trichloroethane	2	U
1,3-Dichlorobenzene	2	U	1,1,2-Trichloroethane	2	U
1,4-Dichlorobenzene	2	U	Trichloroethene	2	U
Dichlorodifluoromethane	2	U	Trichlorofluoromethane	2	U
1,1-Dichloroethane	2	U	1,2,3-Trichloropropane	2	U
1,2-Dichloroethane	2	U	1,2,4-Trimethylbenzene	2	U
1,1-Dichloroethene	2	U	1,3,5-Trimethylbenzene	2	U
cis-1,2-Dichloroethene	2	U	Vinyl Chloride	2	U
trans-1,2-Dichloroethene	2	U	o-Xylene	2	U
1,2-Dichloropropane	2	U	m,p-Xylene	2	U
Acetone	10	U	Diethyl ether	2	U
Carbon Disulfide	2	U	2-Hexanone	10	U
Tetrahydrofuran	5	U	Methyl isobutyl ketone	10	U
Methyl ethyl ketone	10	U	Di-isopropyl ether	2	U
t-Butyl alcohol	80	U	Ethyl t-butyl ether	2	U
t-Amyl methyl ether	2	U			

Surrogate Standard Recovery

d4-1,2-Dichloroethane	105 %	d8-Toluene	100 %	Bromofluorobenzene	97 %

U=Undetected J=Estimated E=Exceeds Calibration Range B=Detected in Blank

METHODOLOGY: Sample analysis was conducted according to: Test Methods for Evaluating Solid Waste, SW-846 Method 8260B.

COMMENTS:

8260 full

Authorized signature

SEVERN TRENT SERVICES

STL Chicago

SEVERN TRENT LABORATORIES
ANALYTICAL REPORT

JOB NUMBER: 212924

Prepared For:

Analytics Environmental Laboratory, LLC
195 Commerce Way
Suite E
Portsmouth, NH 03801

Project: Foster Wheeler Gould Island

Attention: Steve Knollmeyer

Date: 10/28/2002

Linda L Machley for:
Signature

10-28-02
Date

Name: Donna L. Ingersoll

Title: Project Manager

E-Mail: dingersoll@stl-inc.com

STL Chicago
2417 Bond Street
University Park, IL 60466

PHONE: (708) 534-5200
FAX..: (708) 534-5211

STL Chicago is part of Severn Trent Laboratories, Inc.

STL Chicago is part of Severn Trent Laboratories, Inc.

SAMPLE INFORMATION
Date: 10/28/2002

Job Number.: 212924
Customer...: Analytics Environmental Laboratory, LLC
Attn.....: Steve Knollmeyer

Project Number.....: 20000975
Customer Project ID....: FOSTER WHEELER GOULD
Project Description....: Foster Wheeler Gould Island

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
212924-1	GIPII-FRAC1-WC1	Water	10/21/2002	14:10	10/23/2002	10:00
212924-2	GIPII-FRAC2-WC1	Water	10/21/2002	14:25	10/23/2002	10:00
212924-3	GIPII-FRAC3-WC1	Water	10/21/2002	15:05	10/23/2002	10:00

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 212924

Date:10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

Customer Sample ID: GIPII-FRAC1-WC1
Date Sampled.....: 10/21/2002
Time Sampled.....: 14:10
Sample Matrix.....: Water

Laboratory Sample ID: 212924-1
Date Received.....: 10/23/2002
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
160.2	Solids, Total Suspended (TSS)											
	Solids, Total Suspended (TSS)	8.5			4.0	5.0	1	mg/L	66441		10/23/02 1425	jmk
6010B	Metals Analysis (ICAP Trace)											
	Iron	1.8			0.040	0.050	1	mg/L	66704		10/26/02 1213	tds

018/048

* In Description = Dry Wgt.

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 212924

Date:10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC

PROJECT: FOSTER WHEELER GOULD

ATTN: Steve Knollmeyer

Customer Sample ID: GIPII-FRAC2-WC1
Date Sampled.....: 10/21/2002
Time Sampled.....: 14:25
Sample Matrix.....: Water

Laboratory Sample ID: 212924-2
Date Received.....: 10/23/2002
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
160.2	Solids, Total Suspended (TSS)											
	Solids, Total Suspended (TSS)	18			4.0	5.0	1	mg/L	66441		10/23/02 1428	jmk
6010B	Metals Analysis (ICAP Trace)											
	Iron	1.4			0.040	0.050	1	mg/L	66704		10/26/02 1219	tds

019/048

* In Description = Dry Wgt.

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 212924

Date:10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC

PROJECT: FOSTER WHEELER GOULD

ATTN: Steve Knollmeyer

Customer Sample ID: GIPII-FRAC3-WC1
Date Sampled.....: 10/21/2002
Time Sampled.....: 15:05
Sample Matrix.....: Water

Laboratory Sample ID: 212924-3
Date Received.....: 10/23/2002
Time Received.....: 10:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
160.2	Solids, Total Suspended (TSS)											
	Solids, Total Suspended (TSS)	36			4.0	5.0	1	mg/L	66441		10/23/02 1430	jmk
6010B	Metals Analysis (ICAP Trace)											
	Iron	0.40	U		0.40	0.50	10	mg/L	66704		10/26/02 1240	tds

020/048

* In Description = Dry Wgt.

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY CHRONICLE

Job Number: 212924 Date: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

Lab ID: 212924-1 Client ID: GIPII-FRAC1-WC1 Date Recvd: 10/23/2002 Sample Date: 10/21/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED	DILUTION
3010A	Acid Digestion (ICAP)	1	66356		10/23/2002 1600	
6010B	Metals Analysis (ICAP Trace)	1	66704	66356	10/26/2002 1213	
160.2	Solids, Total Suspended (TSS)	1	66441	66441	10/23/2002 1425	

Lab ID: 212924-2 Client ID: GIPII-FRAC2-WC1 Date Recvd: 10/23/2002 Sample Date: 10/21/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED	DILUTION
3010A	Acid Digestion (ICAP)	1	66356		10/23/2002 1600	
6010B	Metals Analysis (ICAP Trace)	1	66704	66356	10/26/2002 1219	
160.2	Solids, Total Suspended (TSS)	1	66441	66441	10/23/2002 1428	

Lab ID: 212924-3 Client ID: GIPII-FRAC3-WC1 Date Recvd: 10/23/2002 Sample Date: 10/21/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED	DILUTION
3010A	Acid Digestion (ICAP)	1	66356		10/23/2002 1600	
6010B	Metals Analysis (ICAP Trace)	1	66704	66356	10/26/2002 1240	10
160.2	Solids, Total Suspended (TSS)	1	66441	66441	10/23/2002 1430	

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

CCB Continuing Calibration Blank 10/26/2002 1154

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

CCB Continuing Calibration Blank 10/26/2002 1330

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

CCB Continuing Calibration Blank 10/26/2002 1452

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

CCB Continuing Calibration Blank 10/26/2002 1613

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

CCB Continuing Calibration Blank 10/26/2002 1659

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.04436 B							

CCB Continuing Calibration Blank 10/26/2002 1820

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

CCB Continuing Calibration Blank 10/26/2002 1942

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc..

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCB	Continuing Calibration Blank				10/26/2002	2019

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1148

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	25.03732		25.00000		100	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1320

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	25.32652		25.00000		101	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1441

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	25.40842		25.00000		102	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1602

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	24.24795		25.00000		97	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1648

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	25.85976		25.00000		103	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1810

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	24.28207		25.00000		97	%	90-110	

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	1931

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	24.61338		25.00000		98	%	90-110	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
CCV	Continuing Calibration Verification	M02JCCV003			10/26/2002	2009

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	23.67919		25.00000		95	%	90-110	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

CRI	Contract Required Detection Limits	M02JCRI002			10/26/2002	1129

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.09998		0.10000		100	%	50-150	

CRI	Contract Required Detection Limits	M02JCRI002			10/26/2002	1627

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.11279		0.10000		113	%	50-150	

CRI	Contract Required Detection Limits	M02JCRI002			10/26/2002	1948

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.10338		0.10000		103	%	50-150	

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
ICB	Initial Calibration Blank				10/26/2002	1036

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
ICV	Initial Calibration Verification	M02JICV002			10/26/2002	1030

Test Method.....: 60108 Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	20.01253		20.00000		100	%	90-110	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

ISA	Interference Check Sample A	M02JISA004			10/26/2002	1135

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	203.72253		200.00000		102	%	80-120	

ISA	Interference Check Sample A	M02JISA004			10/26/2002	1634

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	207.45474		200.00000		104	%	80-120	

ISA	Interference Check Sample A	M02JISA004			10/26/2002	1954

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	203.23425		200.00000		102	%	80-120	

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

ISB	Interference Check Sample B	M02JISB001			10/26/2002	1142

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	203.50018		200.00000		102	%	80-120	

ISB	Interference Check Sample B	M02JISB001			10/26/2002	1640

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	211.09808		200.00000		106	%	80-120	

ISB	Interference Check Sample B	M02JISB001			10/26/2002	2000

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	206.00277		200.00000		103	%	80-120	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

LCS	Laboratory Control Sample	M02ISPK004	66356		10/26/2002	1206

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.99892		1.00000	0.03960 U	100	%	80-120	

LCS	Laboratory Control Sample	M02ISPK004	66236		10/26/2002	1257

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron, Diss.	mg/L	0.95105		1.00000	0.03960 U	95	%	80-120	

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B Analyst...: tds
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704

MB	Method Blank	66356	66356		10/26/2002	1200

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	0.03960 U							

MB	Method Blank	66236	66236		10/26/2002	1305

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron, Diss.	mg/L	0.03960 U							

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924

Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
S1	Standard 1	M02EINT001			10/26/2002	1018

Test Method.....: 6010B
Method Description.: Metals Analysis (ICAP Trace)

Batch.....: 66704

Analyst...: tds

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	10.18122		10.00000		102	%	95-105	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
SZ	Standard 2	M02EINT002			10/26/2002	1024

Test Method.....: 6010B
Method Description.: Metals Analysis (ICAP Trace) Batch.....: 66704 Analyst...: tds

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Iron	mg/L	50.00960		50.00000		100	%	95-105	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

STL Chicago is part of Severn Trent Laboratories, Inc.

QUALITY CONTROL RESULTS

Job Number.: 212924 Report Date.: 10/28/2002

CUSTOMER: Analytics Environmental Laboratory, LLC PROJECT: FOSTER WHEELER GOULD ATTN: Steve Knollmeyer

Test Method.....: 160.2 Batch.....: 66441 Analyst...: jmk
Method Description.: Solids, Total Suspended (TSS) Test Code.: TSS
Parameter.....: Solids, Total Suspended (TSS)

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	66441		mg/L	2.68000 U								10/23/2002	1400
LCS	66441	I02JSTSS1B	mg/L	197.00000		200.00000	4.00000 U	98		%	80-120	10/23/2002	1402

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

REPORT COMMENTS

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.
2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.
3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.
4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. ID# 100201
5) Arizona Environmental Laboratory License number AZ0603.
6) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report)

Inorganic Qualifiers (Q-Column)

U	Analyte was not detected at or above the stated limit.
<	Not detected at or above the reporting limit.
J	Result is less than the RL, but greater than or equal to the method detection limit.
B	Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
S	Result was determined by the Method of Standard Additions.
F	AFCEE: Result is less than the RL, but greater than or equal to the method detection limit.

Inorganic Flags (Flag Column)

'	ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits.
*	LCS, LCD, MD: Batch QC exceeds the upper or lower control limits.
+	MSA correlation coefficient is less than 0.995.
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
E	SD: Serial dilution exceeds the control limits.
H	MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit.
N	MS, MSD: Spike recovery exceeds the upper or lower control limits.
W	AS(GFAA) Post-digestion spike was outside 85-115% control limits.

Organic Qualifiers (Q - Column)

U	Analyte was not detected at or above the stated limit.
ND	Compound not detected.
J	Result is an estimated value below the reporting limit or a tentatively identified compound (TIC).
Q	Result was qualitatively confirmed, but not quantified.
C	Pesticide identification was confirmed by GC/MS.
Y	The chromatographic response resembles a typical fuel pattern.
Z	The chromatographic response does not resemble a typical fuel pattern.
E	Result exceeded calibration range, secondary dilution required.
F	AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)

Organic Flags (Flags Column)

B	MB: Batch QC is greater than reporting limit.
*	LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits.
'	EB1, EB2, EB3, MLE: Batch QC is greater than reporting Limit
A	Concentration exceeds the instrument calibration range
a	Concentration is below the method Reporting Limit (RL)
B	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
H	Alternate peak selection upon analytical review
I	Indicates the presence of an interfence, recovery is not calculated.
M	Manually integrated compound.

P The lower of the two values is reported when the % difference between the results of two GC columns is greater than 25%.

Abbreviations

AS	Post Digestion Spike (GFAA Samples - See Note 1 below)
Batch	Designation given to identify a specific extraction, digestion, preparation set, or analysis set
CAP	Capillary Column CCB Continuing Calibration Blank
CCV	Continuing Calibration Verification
CF	Confirmation analysis of original
C1	Confirmation analysis of A1 or D1
C2	Confirmation analysis of A2 or D2
C3	Confirmation analysis of A3 or D3
CRA	Low Level Standard Check - GFAA; Mercury
CRI	Low Level Standard Check - ICP
CV	Calilbration Verification Standard
Dil Fac	Dilution Factor - Secondary dilution analysis
D1	Dilution 1
D2	Dilution 2
D3	Dilution 3
DLFac	Detection Limit Factor
DSH	Distilled Standard - High Level
DSL	Distilled Standard - Low Level
DSM	Distilled Standard - Medium Level
EB1	Extraction Blank 1
EB2	Extraction Blank 2
EB3	DI Blank
ELC	Method Extracted LCS
ELD	Method Extracted LCD
ICAL	Initial calibration
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
ISA	Interference Check Sample A - ICAP
ISB	Interference Check Sample B - ICAP
Job No.	The first six digits of the sample ID which refers to a specific client, project and sample group
Lab ID	An 8 number unique laboratory identification
LCD	Laboratory Control Standard Duplicate
LCS	Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
MB	Method Blank or (PB) Preparation Blank
MD	Method Duplicate
MDL	Method Detection Limit
MLE	Medium Level Extraction Blank
MRL	Method Reporting Limit Standard
MSA	Method of Standard Additions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not Detected
PREPF	Preparation factor used by the Laboratory's Information Management System (LIMS)
PDS	Post Digestion Spike (ICAP)
RA	Re-analysis of original
A1	Re-analysis of D1
A2	Re-analysis of D2
A3	Re-analysis of D3
RD	Re-extraction of dilution
RE	Re-extraction of original
RC	Re-extraction Confirmation
RL	Reporting Limit
RPD	Relative Percent Difference of duplicate (unrounded) analyses
RRF	Relative Response Factor

RT	Retention Time
RTW	Retention Time Window Sample ID A 9 digit number unique for each sample, the first six digits are referred as the job number
SCB	Seeded Control Blank
SD	Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
UCB	Unseeded Control Blank
SSV	Second Source Verification Standard
SLCS	Solid Laboratory Control Standard(LCS)
PHC	pH Calibration Check LCSP pH Laboratory Control Sample
LCDP	pH Laboratory Control Sample Duplicate
MDPH	pH Sample Duplicate
MDFP	Flashpoint Sample Duplicate
LCFP	Flashpoint LCS
G1	Gelex Check Standard Range 0-1
G2	Gelex Check Standard Range 1-10
G3	Gelex Check Standard Range 10-100
G4	Gelex Check Standard Range 100-1000

Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA).
Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.

STL 212924

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev 6/02

Samples were:
1) Shipped or hand-delivered
2) Temp blank °C 24
3) Received in good condition Y or N
4) pH checked by: JAJ
5) Labels checked by: JAJ

Project#: Proj. Name: GOULD ISLAND PCB REMEDIATION
Company: ANALYTICS
Contact: Stephen Knollmeyer
Address: 195 COMMERCE WAY
PORTSMOUTH, NH 03801
Phone: 603-436-5111 PO# Quote #
Sampler (Signature): Dan Conover

Matrix Key:
WW=Wastewater
SW=Surfacewater
GW=Groundwater
DW=Drinkingwater
S=Soil/Sludge
O=Oil
F=Extract
X=Other

Container Key
P=plastic G=glass

Preservation

	Station Identification	Sample Date	Sample Time	Analysis	Unpres	4°C	HNO3	H2SO4	HCL	Methanol	Other	Matrix	Container number/type		pH	Analytics Sample #
1	GIPII-FRAC1-WC1	10/21/02	1410	TSS		X						WW	1	P		48502-1
1	GIPII-FRAC1-WC1	10/21/02	1410	TOTAL Fe		X	X					WW	1	P		48502-1
2	GIPII-FRAC2-WC1	10/21/02	1425	TSS		X						WW	1	P		48502-2
2	GIPII-FRAC2-WC1	10/21/02	1425	TOTAL Fe		X	X					WW	1	P		48502-2
3	GIPII-FRAC3-WC1	10/21/02	1505	TSS		X						WW	1	P		48502-3
3	GIPII-FRAC3-WC1	10/21/02	1505	TOTAL Fe		X	X					WW	1	P		48502-3

Received By: | Received By: UPS | Received By: Dan Conover

Time: | Time: 1630 | Time: 0938

Date: | Date: 10.22.02 | Date: 10/23/02

Relinquished By Sampler:

Relinquished By: | Relinquished By: UPS

FAX RESULTS? (YES) NO
Fax #: 603-430-2151

Turnaround Request
Standard ☐ Due Date
Priority [X] Due Date 10/25/02 NOON

Comments / Instructions:
Please reference Station ID number and AEL Lab number on report(s).

Standard data package No EDD required.

Page___ of___

Analytics\AEL Documents\AEL COC

639/048

STL Chicago
Internal Sample Custody Transfer Record

Sample Lot#: 212424

Client: AEL - Gould Island

Sample No.	Analysis	Relinquished by:	Received by:	Date	Time	Comments
1-3	Metals			10/23/02	1510	
1-3	Metals			10/23/02	2000	
1-3	TSS			10/24/02	1500	
1-3	TSS			10/24/02	1300	

040/048

CHI-22-11-001/C-1/99

ESI

EnviroSystems, Inc.
One Lafayette Road
P.O. Box 778
Hampton, N.H. 03843-0778
(603) 926-3345 • (603) 926-3521 Fax
www.envirosystems.com

October 29, 2002

Mr. Stephen Knollmeyer
Analytics Environmental Laboratory LLC
195 Commerce Way; Suite E
Portsmouth, New Hampshire 03801

Dear Mr. Knollmeyer:

Enclosed please find results for the samples received on October 28, 2002 for the Gould Island PCB Remediation Project. Should you have any questions, please do not hesitate to call me or Ken Simon.

Sincerely,

EnviroSystems, Inc.

Linnea Hauthaway
Laboratory Manager

Enclosure
LAH:lah
Report Number 10704-02-10

STUDY NUMBER: 10704
CLIENT: Analytics Environmental Laboratory, LLC
PROJECT NAME: Gould Island PCB Remediation
ESI LABORATORY No.: NH00906

Sample Date	Sample Type	Parameter	Results (ppt)	Temperature of Sample (°C)	Date of Analysis	Analyst
10/21/02	GIPPII-FRAC1-WC1	Salinity	4.20	24.0	10/28/02	LH
10/21/02	GIPPII-FRAC2-WC1	Salinity	4.60	24.7	10/28/02	LH
10/21/02	GIPPII-FRAC3-WC1	Salinity	28.10	24.0	10/28/02	LH

NOTES:
Method # - Standard Methods 20th Edition - Method 2520B.

Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire in accordance with the provisions of the NELAC Standards (2000).

References: APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th edition. Washington D.C.

National Environmental Laboratory Accreditation Conference: Quality Systems. Chapter 5. June 2000.

Authorized Signature: _____ 10/29/02
Laboratory Manager ~ EnviroSystems, Incorporated Date

ESI # 10764

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev 2/00

Samples were:
1) Shipped or hand-delivered
2) Temp blank °C _____
3) Received in good condition Y or N
4) pH checked by: _____
5) Labels checked by: _____

Project#: Proj. Name: GOULD ISLAND PCB REMEDIATION

Company: ANALYTICS

Contact: Stephen Knollmeyer

Address: 195 COMMERCE WAY
PORTSMOUTH, NH 03801

Phone: 603-436-5111 PO# Quote #

Sampler (Signature): DAN CONOVER

Matrix Key:
WW=Wastewater
SW=Surfacewater
GW=Groundwate
DW=Drinkingwater
S=Soil/Sludge
O=Oil
E=Extract
X=Other

Container Key
P=plastic G=glass

Preservation: Unpres | 4o C | HNO3 | H2SO4 | HCL | Other

Station Identification	Sample Date	Sample Time	Analysis	Matrix	Container number/type		pH	Analytics Sample #
GIP11-FRAC1-WC1	10.21.02	1410	SALNITY	WW	1	P		48502-1
GIP11-FRAC2-WC1	↓	1425	↓	WW	1	P		-2
GIP11-FRAC3-WC1	↓	1505	↓	WW	1	P		-3

FAX RESULTS? (YES) NO
Fax #: 603-430-2151

Turnaround Request
Standard ☐ Due Date
Priority ☑ Due Date 10.29.02

Comments / Instructions:
Please reference Station ID number and AEL Lab number on report(s).
Please fax
Report by 10.29.02. amb 10.29.02

Page 1 of 1

Relinquished By Sampler:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Date:	Time:	Date: 10/28/02	Time: 0910	Date:	Time:

10/28/02 19:10

Analytics\AEL Documents\AEL COC

STL

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev 6/02

Samples were:
1) Shipped or hand-delivered
2) Temp blank °C _____
3) Received in good condition Y or N
4) pH checked by: _____
5) Labels checked by: _____

Project#: Proj. Name: GOULD ISLAND PCB REMEDIATION

Company: **ANALYTICS**

Contact: **Stephen Knollmeyer**

Address: **195 COMMERCE WAY**
PORTSMOUTH, NH 03801

Phone: **603-436-5111** PO# Quote #

Sampler (Signature): Dan Conover

Matrix Key:
WW=Wastewater
SW=Surfacewater
GW=Groundwater
DW=Drinkingwater
S=Soil/Sludge
O=Oil
E=Extract
X=Other

Container Key
P=plastic G=glass

Station Identification	Sample Date	Sample Time	Analysis	Preservation: Unpres	4°C	HNO_3	H_2SO_4	HCL	Methanol	Other	Matrix	Container number/type		pH	Analytics Sample #
GIPII-FRAC1-WC1	10/21/02	1410	TSS		X						WW	1	P		48502-1
GIPII-FRAC1-WC1	10/21/02	1410	TOTAL Fe		X	X					WW	1	P		48502-1
GIPII-FRAC2-WC1	10/21/02	1425	TSS		X						WW	1	P		48502-2
GIPII-FRAC2-WC1	10/21/02	1425	TOTAL Fe		X	X					WW	1	P		48502-2
GIPII-FRAC3-WC1	10/21/02	1505	TSS		X						WW	1	P		48502-3
GIPII-FRAC3-WC1	10/21/02	1505	TOTAL Fe		X	X					WW	1	P		48502-3

FAX RESULTS? (YES) NO
Fax #: 603-430-2151

Turnaround Request
Standard ☐ Due Date _____
Priority ☒ Due Date 0/25/02 NOON

Comments / Instructions:
Please reference Station ID number and AEL Lab number on report(s).

Standard data package No EDD required.

Page____ of____

Received By: Time: Date:
Received By: Time: Date:
Received By: Time: Date:
Relinquished By Sampler:
Relinquished By:
Relinquished By:

044/048

Analytics\AEL Documents\AEL COC

212924

STL

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev 6/02

Samples were:
1) Shipped or hand-delivered
2) Temp blank °C 24
3) Received in good condition Y or N
4) pH checked by: JAJ
5) Labels checked by: JAJ

Project#: Proj. Name: GOULD ISLAND PCB REMEDIATION

Company: ANALYTICS

Contact: Stephen Knollmeyer

Address: 195 COMMERCE WAY
PORTSMOUTH, NH 03801

Phone: 603-436-5111 PO# Quote #

Sampler (Signature): Dan Conover

Matrix Key: WW=Wastewater, SW=Surfacewater, GW=Groundwater, DW=Drinkingwater, S=Soil/Sludge, O=Oil, F=Extract, X=Other

Container Key: P=plastic G=glass

Station Identification	Sample Date	Sample Time	Analysis	Unpres	4°C	HNO3	H2SO4	HCl	Methanol	Other	Matrix	Container number	type	pH	Analytics Sample #
GIPII-FRAC1-WC1	10/21/02	1410	TSS		X						WW	1	P		48502-1
GIPII-FRAC1-WC1	10/21/02	1410	TOTAL Fe		X	X					WW	1	P		48502-1
GIPII-FRAC2-WC1	10/21/02	1425	TSS		X						WW	1	P		48502-2
GIPII-FRAC2-WC1	10/21/02	1425	TOTAL Fe		X	X					WW	1	P		48502-2
GIPII-FRAC3-WC1	10/21/02	1505	TSS		X						WW	1	P		48502-3
GIPII-FRAC3-WC1	10/21/02	1505	TOTAL Fe		X	X					WW	1	P		48502-3

-1 -2 -3

Relinquished By	Date	Time	Received By
Relinquished by Sampler: [signature]	10/25/02	1700	Received By: FedEx 10.25.02
Relinquished By: [signature]	10.22.02	1630	Received By: UPS
Relinquished By: UPS	10/23/02	1300	Received By: [signature]

Cooler @ 4°C upon arrival
DATE 10.25.02 TIME 11:00 RECEIVED BY [signature]

FAX RESULTS? (YES) NO

Fax #: 603-430-2151

Comments / Instructions:
Please reference Station ID number and AEL Lab number on report(s).

Standard data package No EDD required.

Turnaround Request

Standard [ ] Due Date ______

Priority [X] Due Date 10/25/02 NOON

Page___ of___

Analytics\AEL Documents\AEL COC

045/048

analytic environmental laboratory LLC

195 Commerce W Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev 2/00

Samples were:
1) Shipped or hand-delivered
2) Temp blank oC 0°C
3) Received in good condition (Y) or N
4) pH checked by: JB 10/21/02
5) Labels checked by: AK 10/21/02

Project #: CTO 69 Proj. Name: GOULD ISLAND PCB REMEDIATION

Company: FOSTER WHEELER ENVIRONMENTAL CORP.

Contact: Rick Woodworth

Address: 2300 Lincoln Highway, One Oxford Valley, Suite 200

Langhorne, PA 19113

Phone: (215) 702-4049 PO#: Quote#

Sampler (Signature)

Matrix Key:
WW=Wastewater
SW=Surfacewater
GW=Groundwater
DW=Drinkingwater
S=Soil/Sludge
O=Oil
E=Extract
X=Other

Container Key
P=plastic G=glass

Preservation

Station Identification	Sample Date	Sample Time	Analysis	Unpres	4° C	HNO_3	H_2SO_4	HCL	Other	Matrix	Container number/type		pH	Analytics Sample #
GIPII-FRAC1-WC1	10/21/02	1410	PCB, SVOC, VOC, TSS, ~~CHLORIDE~~, TOTAL FE, ~~NA~~ SLK 10/22/02		X	X		X		WW	2 6	P G	6	48502-1
GIPII-FRAC2-WC1	10/21/02	1425	PCB, SVOC, VOC, TSS, ~~CHLORIDE~~, TOTAL FE, ~~NA~~ SLK 10/22/02		X	X		X		WW	2 5	P G	6	-2
GIPII-FRAC3-WC1	10/21/02	1505	PCB, SVOC, VOC, TSS, ~~CHLORIDE~~, TOTAL FE, ~~NA~~ SLK 10/22/02		X	X		X		WW	2 5	P G	6	-3
~~TEMP~~ TRIP BLANK	10/21/02				X						1	G		-4

Received by: Time: 1705 Date: 10/21/02

Received by: Time: Date:

Received by: Time: Date:

FAX RESULTS? (YES) NO
Fax # (215) 702-4045

Turnaround Request

Standard ☐ Due Date
Priority [X] Due Date 10/23/02

Comments / Instructions:

Please fax results to Gould Island Site Trailer as well. (401) 845-4169.

Turnaround Time: 48 - Hour

NO CHLORIDE OR NA PER R. WOODWORTH @ FWEC SLK 10/22/02

Client Code: FWECRI

Page 1 of 1

Relinquished by Sampler:

Relinquished by:

Relinquished by:

046048

ANALYTICS SAMPLE RECEIPT CHECKLIST

AEL LAB#: 48502
CLIENT: Foster Wheeler
PROJECT: Gould Island

COOLER NUMBER: —
NUMBER OF COOLERS: 1
DATE RECEIVED: 10/21/02

A: PRELIMINARY EXAMINATION:

DATE COOLER OPENED: 10/21/02

1. Cooler received by(initials) JB — Date Received: 10/21/02
2. Did cooler come with a shipping slip? Y (N/A)

If YES, enter carrier name and airbill number here: _____

3. Were custody seals on the outside of cooler? JB 10/22/02 (Y) N
How many & where: _____ Seal Date: _____ Seal Name: _____
4. Did the custody seals arrive unbroken and intact upon arrival? JB 10/22/02 (Y) N/A
5. COC#: _____
6. Were Custody papers filled out properly (ink,signed, etc)? (Y) N
7. Were custody papers sealed in a plastic bag? Y (N)
8. Did you sign the COC in the appropriate place? (Y) N
9. Was the project identifiable from the COC papers? (Y) N
10. Was enough ice used to chill the cooler? (Y) N — Temp. of cooler: 0°C

B. Log-In: Date samples were logged in: 10/21/02 — By: JB

11. Type of packing in cooler(bubble wrap, popcorn) Y (N/A)
12. Were all bottles sealed in separate plastic bags? Y (N)
13. Did all bottles arrive unbroken and were labels in good condition? (Y) N
14. Were all bottle labels complete(ID,Date,time,etc.) (Y) N
15. Did all bottle labels agree with custody papers? (Y) 10/21/10 (N)
No The chain says Temp blank but the vial says Trip Blank
16. Were the correct containers used for the tests indicated: (Y) N
17. Were samples received at the correct pH? (Y) N
18. Was sufficient amount of sample sent for the tests indicated? (Y) N
19. Were bubbles absent in VOA samples? (Y) N

If NO, List sample #'s: _____

20. Laboratory labeling verified by (initials): AL — Date: 10/21/02

Kaczka, David

From: Ingersoll, Donna
Sent: Friday, October 25, 2002 3:09 PM
To: Kaczka, David; James, Jeff
Subject: 212924 AEL samples to return

AEL has asked that we return the AEL samples on 212924-1,2,3. We can ship on their UPS account # 6A55V5. They said to ice & ship for Monday delivery. Thanks!

Donna Ingersoll
Project Manager
STL Chicago
ph. Tu,W: 708-534-5200
fax 708-534-5211
remote ph. M,Th,F: 217-454-5315
remote fax: 217-486-2134

APPENDIX D

Carbon Usage Calculations and Isotherm

Foster Wheeler
Mr. R. Woodworth

Mobile Treatment System Project – Rhode Island
System Design Calculations @ **15 gpm**

PCB Arochlor-1260 Isotherm (attached) provided by granular activated carbon (GAC) manufacturer.

Influent Concentration – **3.9 ug/L**

Mass Flow Rate of PCB-1260 @ 15 gpm = 3.9 ug/L X 1 mg/1000 ug X 15 gallons/minute X 60 minutes/hour X 3.785 liters/gallon =

13.29 mg PCB-1260 per hour @ 15 gpm

System Effluent Concentration - **< 0.5 ug/L - (Assume 0.25 ug/L is acceptable)**

Based on an allowable effluent (residual) concentration of **0.25 ug/L**, the Isotherm indicates a removal rate of approximately **1.65 mg of PCB-1260 adsorbed per gram (1,000 mg) of GAC.**

Carbon usage rate = 1.65 mg PCB-1260 adsorbed/1000 mg GAC used = 13.29 mg PCB per hour/X mg GAC used=

Solving for X = 8,051.73 milligrams (8.05 grams) GAC consumed per hour or approximately
0.018 pounds of GAC consumed per hour

Assuming 40,000 gallons to be treated at 15 gpm = **44.44 hours of treatment** X 0.018 pounds GAC used per hour = **0.8 pounds of carbon used for total project**

*******This projection assumes that no other dissolved hydrocarbons nor dissolved natural organics are in the water to be treated. ******

Therefore, the PCB-1260 should not break-through the GAC units.

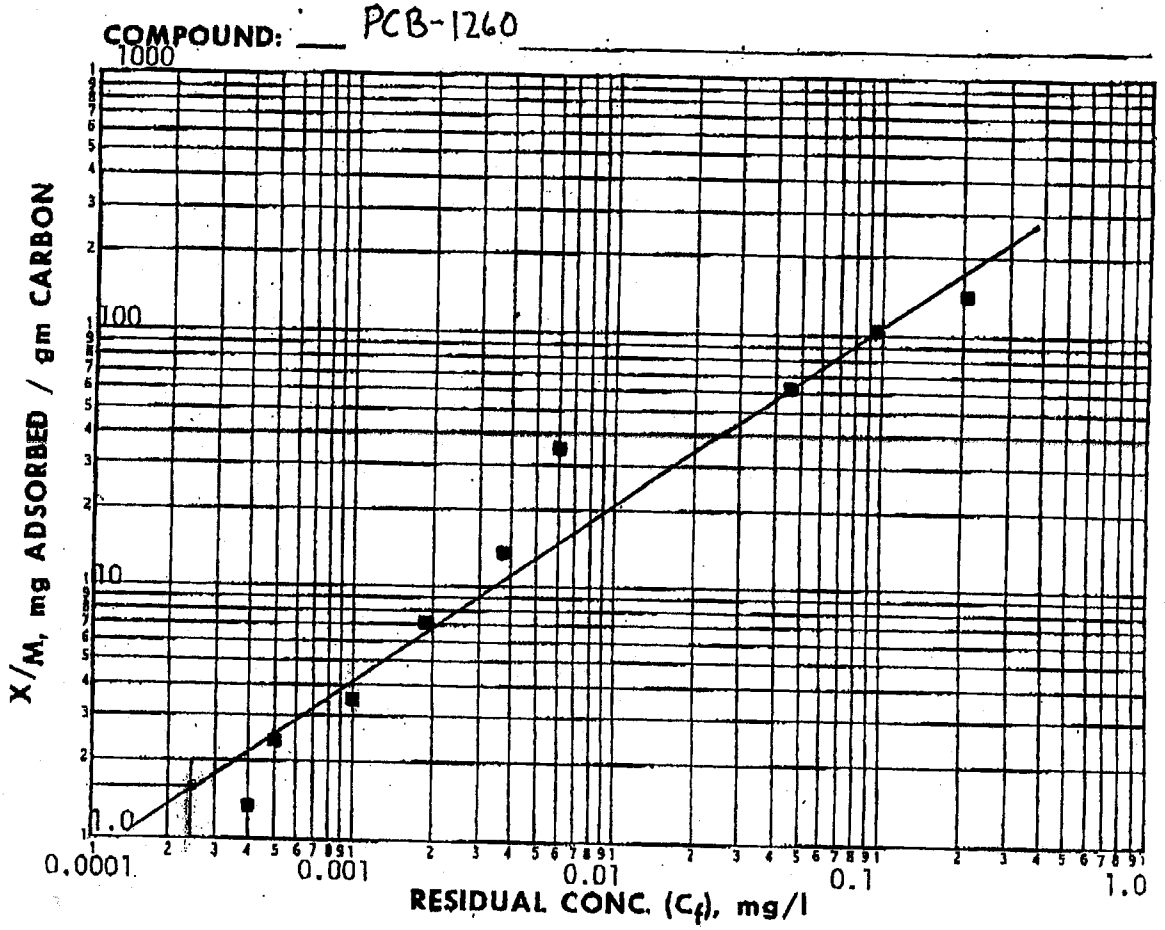
A contact time of 20 minutes is generally required for carbon adsorption applications for most hydrocarbons.

Contact time (per 1,000 lb. unit) = 1,000 pounds GAC / 27.65 pounds/cubic foot (manufacturer provided carbon density) = 36.166 cubic feet of carbon per unit X 7.48 gallons per cubic foot = 270.52 gallons per vessel.

Contact time (t) = Volume of GAC Bed (V) / Flow (Q)

T = 270.52 gallons / 15 gpm = approx. **18.04 minutes contact time** per 1,000 pound GAC unit X 2 units =

Approximately 36.1 minutes of contact time for both units, which should be sufficient to prevent breakthrough of the PCB-1260 Arochlor after the 2nd unit at concentrations above 0.5 ug/L.


COMPOUND: PCB-1260
1000
100
10
1.0
X/M, mg ADSORBED / gm CARBON
0.0001
0.001
0.01
0.1
1.0
RESIDUAL CONC. (Cf), mg/l

APPENDIX E

CORMIX Modeling Results

CORMIX1 PREDICTION FILE:
1111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
CORNELL MIXING ZONE EXPERT SYSTEM
Subsystem CORMIX1: Subsystem version:
Submerged Single Port Discharges CORMIX_v.3.20_____September_1996

CASE DESCRIPTION
Site name/label: Gould_Island
Design case: Mean^Current
FILE NAME: cormix\sim\Final3 .cx1
Time of Fortran run: 11/04/02--13:17:18

ENVIRONMENT PARAMETERS (metric units)
Unbounded section
HA = 9.50 HD = 7.30
UA = .150 F = .015 USTAR = .6458E-02
UW = 2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND= U RHOAM = 1024.0000

DISCHARGE PARAMETERS (metric units)
BANK = LEFT DISTB = 42.00
D0 = .102 A0 = .008 H0 = .31
THETA = 90.00 SIGMA = .00
U0 = .197 Q0 = .002 = .1600E-02
RHO0 = 1018.0000 DRHO0 = .6000E+01 GP0 = .5746E-01
C0 = .5000E+00 CUNITS= ppb
IPOLL = 1 KS = .0000E+00 KD = .0000E+00

FLUX VARIABLES (metric units)
Q0 = .1600E-02 M0 = .3158E-03 J0 = .9194E-04 SIGNJ0= 1.0
Associated length scales (meters)
LQ = .09 LM = .25 Lm = .12 Lb = .03
Lmp = 99999.00 Lbp = 99999.00

NON-DIMENSIONAL PARAMETERS
FR0 = 2.58 R = 1.31

FLOW CLASSIFICATION
1111111111111111111111111111111111111111111
1 Flow class (CORMIX1) = V1 1
1 Applicable layer depth HS = 7.30 1
1111111111111111111111111111111111111111111

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
C0 = .5000E+00 CUNITS= ppb
NTOX = 0
NSTD = 0
REGMZ = 0
XINT = 1000.00 XMAX = 1000.00

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and below the center of the port:
42.00 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 50 display intervals per module

BEGIN MOD101: DISCHARGE MODULE

X	Y	Z	S	C	B
.00	.00	.31	1.0	.500E+00	.05

END OF MOD101: DISCHARGE MODULE

BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Jet/plume transition motion in strong crossflow.

Zone of flow establishment: THETAE= .00 SIGMAE= .00
LE = .00 XE = .00 YE = .00 ZE = .31

Profile definitions:
B = Gaussian 1/e (37%) half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	B
.00	.00	.31	1.0	.485E+00	.05
1.12	.00	.58	5.9	.847E-01	.12
2.26	.00	.82	13.5	.370E-01	.18
3.40	.00	1.02	22.5	.222E-01	.23
4.54	.00	1.20	32.6	.153E-01	.27
5.69	.00	1.37	43.5	.115E-01	.32
6.84	.00	1.53	55.2	.905E-02	.36
7.99	.00	1.68	67.6	.739E-02	.40
9.14	.00	1.82	80.6	.620E-02	.43
10.29	.00	1.95	94.1	.531E-02	.47
11.44	.00	2.09	108.2	.462E-02	.50
12.60	.00	2.21	122.7	.408E-02	.53
13.75	.00	2.34	137.7	.363E-02	.57
14.90	.00	2.46	153.0	.327E-02	.60
16.05	.00	2.57	168.8	.296E-02	.63
17.21	.00	2.69	185.0	.270E-02	.66
18.36	.00	2.80	201.5	.248E-02	.69
19.52	.00	2.91	218.4	.229E-02	.71
20.67	.00	3.02	235.6	.212E-02	.74
21.82	.00	3.12	253.1	.198E-02	.77
22.98	.00	3.23	270.9	.185E-02	.80
24.13	.00	3.33	289.0	.173E-02	.82
25.29	.00	3.43	307.5	.163E-02	.85
26.44	.00	3.53	326.1	.153E-02	.87
27.60	.00	3.63	345.1	.145E-02	.90
28.75	.00	3.72	364.3	.137E-02	.92

29.91	.00	3.82	383.8	.130E-02	.95
31.07	.00	3.91	403.6	.124E-02	.97
32.22	.00	4.01	423.5	.118E-02	1.00
33.37	.00	4.10	443.7	.113E-02	1.02
34.53	.00	4.19	464.1	.108E-02	1.04
35.68	.00	4.28	484.8	.103E-02	1.07
36.84	.00	4.37	505.6	.989E-03	1.09
37.99	.00	4.45	526.7	.949E-03	1.11
39.14	.00	4.54	548.0	.912E-03	1.13
40.30	.00	4.63	569.5	.878E-03	1.16
41.45	.00	4.71	591.2	.846E-03	1.18
42.61	.00	4.80	613.1	.816E-03	1.20
43.76	.00	4.88	635.2	.787E-03	1.22
44.92	.00	4.96	657.5	.760E-03	1.24
46.07	.00	5.05	680.0	.735E-03	1.26
47.23	.00	5.13	702.6	.712E-03	1.28
48.38	.00	5.21	725.5	.689E-03	1.30
49.53	.00	5.29	748.5	.668E-03	1.32
50.69	.00	5.37	771.7	.648E-03	1.35
51.84	.00	5.45	795.1	.629E-03	1.37
53.00	.00	5.53	818.7	.611E-03	1.39
54.15	.00	5.60	842.4	.594E-03	1.41
55.31	.00	5.68	866.3	.577E-03	1.43
56.46	.00	5.76	890.3	.562E-03	1.45
57.62	.00	5.84	914.5	.547E-03	1.46

Cumulative travel time = 374. sec

END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

BEGIN MOD131: LAYER BOUNDARY/TERMINAL LAYER APPROACH

Control volume inflow:

X	Y	Z	S	C	B
57.62	.00	5.84	914.5	.547E-03	1.46

Profile definitions:

BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH	ZU	ZL	
56.15	.00	7.30	914.5	.547E-03	.00	.00	7.30	7.30	
56.59	.00	7.30	914.5	.547E-03	1.81	.91	7.30	5.49	
57.03	.00	7.30	914.5	.547E-03	2.15	1.29	7.30	5.15	
57.47	.00	7.30	914.5	.547E-03	2.36	1.58	7.30	4.94	
57.91	.00	7.30	939.6	.532E-03	2.52	1.82	7.30	4.78	
58.35	.00	7.30	1056.2	.473E-03	2.64	2.04	7.30	4.66	
58.79	.00	7.30	1217.2	.411E-03	2.73	2.23	7.30	4.57	
59.23	.00	7.30	1363.8	.367E-03	2.80	2.41	7.30	4.50	

59.67	.00	7.30	1464.6	.341E-03	2.84	2.58	7.30	4.46
60.11	.00	7.30	1519.1	.329E-03	2.87	2.73	7.30	4.43
60.55	.00	7.30	1554.7	.322E-03	2.88	2.88	7.30	4.42

Cumulative travel time = 394. sec

END OF MOD131: LAYER BOUNDARY/TERMINAL LAYER APPROACH

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD141: BUOYANT AMBIENT SPREADING

Profile definitions:
BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
60.55	.00	7.30	1554.7	.322E-03	2.88	2.88	7.30	4.42
62.93	.00	7.30	1575.4	.317E-03	2.81	2.99	7.30	4.49
65.32	.00	7.30	1595.9	.313E-03	2.74	3.11	7.30	4.56
67.70	.00	7.30	1616.2	.309E-03	2.68	3.22	7.30	4.62
70.09	.00	7.30	1636.5	.306E-03	2.62	3.33	7.30	4.68
72.47	.00	7.30	1656.7	.302E-03	2.57	3.43	7.30	4.73
74.86	.00	7.30	1676.9	.298E-03	2.53	3.54	7.30	4.77
77.24	.00	7.30	1697.2	.295E-03	2.48	3.64	7.30	4.82
79.63	.00	7.30	1717.6	.291E-03	2.45	3.74	7.30	4.85
82.01	.00	7.30	1738.1	.288E-03	2.41	3.85	7.30	4.89
84.40	.00	7.30	1758.8	.284E-03	2.38	3.95	7.30	4.92
86.78	.00	7.30	1779.7	.281E-03	2.35	4.04	7.30	4.95
89.17	.00	7.30	1800.9	.278E-03	2.32	4.14	7.30	4.98
91.55	.00	7.30	1822.3	.274E-03	2.29	4.24	7.30	5.01
93.94	.00	7.30	1844.0	.271E-03	2.27	4.33	7.30	5.03
96.32	.00	7.30	1866.0	.268E-03	2.25	4.43	7.30	5.05
98.71	.00	7.30	1888.3	.265E-03	2.23	4.52	7.30	5.07
101.09	.00	7.30	1910.9	.262E-03	2.21	4.61	7.30	5.09
103.48	.00	7.30	1934.0	.259E-03	2.19	4.70	7.30	5.11
105.86	.00	7.30	1957.4	.255E-03	2.18	4.79	7.30	5.12
108.25	.00	7.30	1981.1	.252E-03	2.16	4.88	7.30	5.14
110.63	.00	7.30	2005.3	.249E-03	2.15	4.97	7.30	5.15
113.02	.00	7.30	2029.9	.246E-03	2.14	5.06	7.30	5.16
115.40	.00	7.30	2055.0	.243E-03	2.13	5.15	7.30	5.17
117.79	.00	7.30	2080.5	.240E-03	2.12	5.23	7.30	5.18
120.17	.00	7.30	2106.4	.237E-03	2.11	5.32	7.30	5.19
122.55	.00	7.30	2132.9	.234E-03	2.11	5.40	7.30	5.19
124.94	.00	7.30	2159.8	.232E-03	2.10	5.49	7.30	5.20
127.32	.00	7.30	2187.2	.229E-03	2.09	5.57	7.30	5.21
129.71	.00	7.30	2215.1	.226E-03	2.09	5.65	7.30	5.21
132.09	.00	7.30	2243.5	.223E-03	2.09	5.74	7.30	5.21
134.48	.00	7.30	2272.4	.220E-03	2.08	5.82	7.30	5.22

136.86	.00	7.30	2301.9	.217E-03	2.08	5.90	7.30	5.22
139.25	.00	7.30	2331.9	.214E-03	2.08	5.98	7.30	5.22
141.63	.00	7.30	2362.4	.212E-03	2.08	6.06	7.30	5.22
144.02	.00	7.30	2393.5	.209E-03	2.08	6.14	7.30	5.22
146.40	.00	7.30	2425.2	.206E-03	2.08	6.22	7.30	5.22
148.79	.00	7.30	2457.5	.203E-03	2.08	6.30	7.30	5.22
151.17	.00	7.30	2490.3	.201E-03	2.08	6.38	7.30	5.22
153.56	.00	7.30	2523.7	.198E-03	2.09	6.45	7.30	5.21
155.94	.00	7.30	2557.7	.195E-03	2.09	6.53	7.30	5.21
158.33	.00	7.30	2592.2	.193E-03	2.09	6.61	7.30	5.21
160.71	.00	7.30	2627.4	.190E-03	2.10	6.68	7.30	5.20
163.10	.00	7.30	2663.2	.188E-03	2.10	6.76	7.30	5.20
165.48	.00	7.30	2699.7	.185E-03	2.11	6.83	7.30	5.19
167.87	.00	7.30	2736.7	.183E-03	2.11	6.91	7.30	5.19
170.25	.00	7.30	2774.4	.180E-03	2.12	6.98	7.30	5.18
172.64	.00	7.30	2812.7	.178E-03	2.13	7.06	7.30	5.17
175.02	.00	7.30	2851.6	.175E-03	2.13	7.13	7.30	5.17
177.41	.00	7.30	2891.2	.173E-03	2.14	7.21	7.30	5.16
179.79	.00	7.30	2931.5	.171E-03	2.15	7.28	7.30	5.15

Cumulative travel time = 1189. sec

END OF MOD141: BUOYANT AMBIENT SPREADING

Bottom coordinate for FAR-FIELD is determined by average depth, ZFB = -2.20m

---

BEGIN MOD161: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

Vertical diffusivity (initial value) = .956E-02 m^2/s
Horizontal diffusivity (initial value) = .212E-01 m^2/s

Profile definitions:
BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	
179.79	.00	7.30	2931.5	.171E-03	2.15	7.28	7.30	5.15	
195.70	.00	7.30	3157.8	.158E-03	2.17	7.77	7.30	5.13	
211.60	.00	7.30	3393.4	.147E-03	2.19	8.27	7.30	5.11	
227.51	.00	7.30	3638.5	.137E-03	2.21	8.78	7.30	5.09	
243.41	.00	7.30	3893.4	.128E-03	2.23	9.30	7.30	5.07	
259.32	.00	7.30	4158.2	.120E-03	2.26	9.83	7.30	5.04	
275.22	.00	7.30	4433.5	.113E-03	2.28	10.37	7.30	5.02	
291.13	.00	7.30	4719.4	.106E-03	2.31	10.92	7.30	4.99	
307.03	.00	7.30	5016.3	.997E-04	2.33	11.48	7.30	4.97	
322.94	.00	7.30	5324.5	.939E-04	2.36	12.05	7.30	4.94	
338.84	.00	7.30	5644.4	.886E-04	2.38	12.62	7.30	4.92	

354.75	.00	7.30	5976.4	.837E-04	2.41	13.21	7.30	4.89
370.65	.00	7.30	6320.8	.791E-04	2.44	13.80	7.30	4.86
386.56	.00	7.30	6678.1	.749E-04	2.47	14.41	7.30	4.83
402.46	.00	7.30	7048.8	.709E-04	2.50	15.02	7.30	4.80
418.37	.00	7.30	7433.1	.673E-04	2.53	15.64	7.30	4.77
434.27	.00	7.30	7831.7	.638E-04	2.57	16.27	7.30	4.73
450.18	.00	7.30	8245.0	.606E-04	2.60	16.91	7.30	4.70
466.08	.00	7.30	8673.4	.576E-04	2.64	17.55	7.30	4.66
481.99	.00	7.30	9117.5	.548E-04	2.67	18.20	7.30	4.63
497.89	.00	7.30	9577.8	.522E-04	2.71	18.87	7.30	4.59
513.80	.00	7.30	10055.0	.497E-04	2.75	19.53	7.30	4.55
529.70	.00	7.30	10549.4	.474E-04	2.78	20.21	7.30	4.52
545.61	.00	7.30	11061.8	.452E-04	2.82	20.90	7.30	4.48
561.51	.00	7.30	11592.8	.431E-04	2.86	21.59	7.30	4.44
577.42	.00	7.30	12142.9	.412E-04	2.91	22.29	7.30	4.39
593.32	.00	7.30	12712.8	.393E-04	2.95	22.99	7.30	4.35
609.23	.00	7.30	13303.2	.376E-04	2.99	23.71	7.30	4.31
625.13	.00	7.30	13914.8	.359E-04	3.04	24.43	7.30	4.26
641.04	.00	7.30	14548.3	.344E-04	3.08	25.16	7.30	4.22
656.94	.00	7.30	15204.3	.329E-04	3.13	25.89	7.30	4.17
672.85	.00	7.30	15883.7	.315E-04	3.18	26.64	7.30	4.12
688.75	.00	7.30	16587.2	.301E-04	3.23	27.39	7.30	4.07
704.66	.00	7.30	17315.5	.289E-04	3.28	28.14	7.30	4.02
720.56	.00	7.30	18069.4	.277E-04	3.33	28.91	7.30	3.97
736.47	.00	7.30	18849.8	.265E-04	3.39	29.68	7.30	3.91
752.37	.00	7.30	19657.5	.254E-04	3.44	30.45	7.30	3.86
768.28	.00	7.30	20493.2	.244E-04	3.50	31.24	7.30	3.80
784.18	.00	7.30	21357.8	.234E-04	3.56	32.03	7.30	3.74
800.09	.00	7.30	22252.2	.225E-04	3.62	32.82	7.30	3.68
815.99	.00	7.30	23177.2	.216E-04	3.68	33.63	7.30	3.62
831.90	.00	7.30	24133.6	.207E-04	3.74	34.44	7.30	3.56
847.80	.00	7.30	25122.4	.199E-04	3.80	35.25	7.30	3.50
863.71	.00	7.30	26144.4	.191E-04	3.87	36.07	7.30	3.43
879.61	.00	7.30	27200.4	.184E-04	3.93	36.90	7.30	3.37
895.52	.00	7.30	28291.3	.177E-04	4.00	37.74	7.30	3.30
911.42	.00	7.30	29418.0	.170E-04	4.07	38.58	7.30	3.23
927.33	.00	7.30	30581.4	.163E-04	4.14	39.43	7.30	3.16
943.23	.00	7.30	31782.2	.157E-04	4.21	40.28	7.30	3.09
959.14	.00	7.30	33021.3	.151E-04	4.28	41.14	7.30	3.02
975.04	.00	7.30	34299.6	.146E-04	4.36	42.00	7.30	2.94

Cumulative travel time = 6490. sec

Plume Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	
975.04	42.00	7.30	34299.6	.146E-04	4.36	84.01	7.30	2.94	
975.54	42.00	7.30	34366.3	.145E-04	4.36	84.04	7.30	2.94	
976.04	42.00	7.30	34433.1	.145E-04	4.37	84.08	7.30	2.93	
976.54	42.00	7.30	34500.0	.145E-04	4.38	84.11	7.30	2.92	
977.04	42.00	7.30	34566.8	.145E-04	4.38	84.14	7.30	2.92	
977.54	42.00	7.30	34633.8	.144E-04	4.39	84.18	7.30	2.91	
978.04	42.00	7.30	34700.7	.144E-04	4.40	84.21	7.30	2.90	
978.54	42.00	7.30	34767.7	.144E-04	4.40	84.25	7.30	2.90	

979.03	42.00	7.30	34834.7	.144E-04	4.41	84.28	7.30	2.89
979.53	42.00	7.30	34901.8	.143E-04	4.42	84.32	7.30	2.88
980.03	42.00	7.30	34968.9	.143E-04	4.42	84.35	7.30	2.88
980.53	42.00	7.30	35036.0	.143E-04	4.43	84.39	7.30	2.87
981.03	42.00	7.30	35103.2	.142E-04	4.44	84.42	7.30	2.86
981.53	42.00	7.30	35170.4	.142E-04	4.44	84.45	7.30	2.86
982.03	42.00	7.30	35237.7	.142E-04	4.45	84.49	7.30	2.85
982.53	42.00	7.30	35305.0	.142E-04	4.46	84.52	7.30	2.84
983.03	42.00	7.30	35372.3	.141E-04	4.46	84.56	7.30	2.84
983.53	42.00	7.30	35439.6	.141E-04	4.47	84.59	7.30	2.83
984.03	42.00	7.30	35507.0	.141E-04	4.48	84.63	7.30	2.82
984.53	42.00	7.30	35574.4	.141E-04	4.48	84.66	7.30	2.82
985.02	42.00	7.30	35641.9	.140E-04	4.49	84.70	7.30	2.81
985.52	42.00	7.30	35709.4	.140E-04	4.50	84.73	7.30	2.80
986.02	42.00	7.30	35776.9	.140E-04	4.50	84.76	7.30	2.80
986.52	42.00	7.30	35844.5	.139E-04	4.51	84.80	7.30	2.79
987.02	42.00	7.30	35912.1	.139E-04	4.52	84.83	7.30	2.78
987.52	42.00	7.30	35979.7	.139E-04	4.52	84.87	7.30	2.78
988.02	42.00	7.30	36047.4	.139E-04	4.53	84.90	7.30	2.77
988.52	42.00	7.30	36115.1	.138E-04	4.54	84.94	7.30	2.76
989.02	42.00	7.30	36182.8	.138E-04	4.54	84.97	7.30	2.76
989.52	42.00	7.30	36250.6	.138E-04	4.55	85.01	7.30	2.75
990.02	42.00	7.30	36318.4	.138E-04	4.56	85.04	7.30	2.74
990.52	42.00	7.30	36386.2	.137E-04	4.56	85.07	7.30	2.74
991.02	42.00	7.30	36454.1	.137E-04	4.57	85.11	7.30	2.73
991.51	42.00	7.30	36522.0	.137E-04	4.58	85.14	7.30	2.72
992.01	42.00	7.30	36590.0	.137E-04	4.58	85.18	7.30	2.72
992.51	42.00	7.30	36657.9	.136E-04	4.59	85.21	7.30	2.71
993.01	42.00	7.30	36725.9	.136E-04	4.60	85.25	7.30	2.70
993.51	42.00	7.30	36794.0	.136E-04	4.60	85.28	7.30	2.70
994.01	42.00	7.30	36862.0	.136E-04	4.61	85.32	7.30	2.69
994.51	42.00	7.30	36930.1	.135E-04	4.62	85.35	7.30	2.68
995.01	42.00	7.30	36998.3	.135E-04	4.62	85.38	7.30	2.68
995.51	42.00	7.30	37066.4	.135E-04	4.63	85.42	7.30	2.67
996.01	42.00	7.30	37134.6	.135E-04	4.64	85.45	7.30	2.66
996.51	42.00	7.30	37202.9	.134E-04	4.64	85.49	7.30	2.66
997.01	42.00	7.30	37271.1	.134E-04	4.65	85.52	7.30	2.65
997.51	42.00	7.30	37339.4	.134E-04	4.66	85.56	7.30	2.64
998.00	42.00	7.30	37407.8	.134E-04	4.66	85.59	7.30	2.64
998.50	42.00	7.30	37476.1	.133E-04	4.67	85.63	7.30	2.63
999.00	42.00	7.30	37544.5	.133E-04	4.68	85.66	7.30	2.62
999.50	42.00	7.30	37612.9	.133E-04	4.68	85.70	7.30	2.62
1000.00	42.00	7.30	37681.4	.133E-04	4.69	85.73	7.30	2.61

Cumulative travel time = 6657. sec

Simulation limit based on maximum specified distance = 1000.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD161: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

CORMIX1: Submerged Single Port Discharges End of Prediction File

11111111111111111111111111111111111111111111111111111111111111111111111111111111111111

CORMIX1 PREDICTION FILE:
1111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
CORNELL MIXING ZONE EXPERT SYSTEM
Subsystem CORMIX1: Subsystem version:
Submerged Single Port Discharges CORMIX_v.3.20_____September_1996

CASE DESCRIPTION
Site name/label: Gould_Island
Design case: Weak^Current
FILE NAME: cormix\sim\final2 .cx1
Time of Fortran run: 11/04/02--13:15:28

ENVIRONMENT PARAMETERS (metric units)
Unbounded section
HA = 9.50 HD = 7.30
UA = .050 F = .015 USTAR = .2153E-02
UW = 2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND= U RHOAM = 1024.0000

DISCHARGE PARAMETERS (metric units)
BANK = LEFT DISTB = 42.00
D0 = .102 A0 = .008 H0 = .31
THETA = 90.00 SIGMA = .00
U0 = .197 Q0 = .002 = .1600E-02
RHO0 = 1018.0000 DRHO0 = .6000E+01 GP0 = .5746E-01
C0 = .5000E+00 CUNITS= ppb
IPOLL = 1 KS = .0000E+00 KD = .0000E+00

FLUX VARIABLES (metric units)
Q0 = .1600E-02 M0 = .3158E-03 J0 = .9194E-04 SIGNJ0= 1.0
Associated length scales (meters)
LQ = .09 LM = .25 Lm = .36 Lb = .74
Lmp = 99999.00 Lbp = 99999.00

NON-DIMENSIONAL PARAMETERS
FR0 = 2.58 R = 3.94

FLOW CLASSIFICATION
1111111111111111111111111111111111111111
1 Flow class (CORMIX1) = V1 1
1 Applicable layer depth HS = 7.30 1
1111111111111111111111111111111111111111

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
C0 = .5000E+00 CUNITS= ppb
NTOX = 0
NSTD = 0
REGMZ = 0
XINT = 1000.00 XMAX = 1000.00

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and below the center of the port:
42.00 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 50 display intervals per module

BEGIN MOD101: DISCHARGE MODULE

X	Y	Z	S	C	B
.00	.00	.31	1.0	.500E+00	.05

END OF MOD101: DISCHARGE MODULE

BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Jet/plume transition motion in strong crossflow.

Zone of flow establishment: THETAE= 62.13 SIGMAE= .00
LE = .06 XE = .01 YE = .00 ZE = .36

Profile definitions:
B = Gaussian 1/e (37%) half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	B
.00	.00	.31	1.0	.500E+00	.05
.01	.00	.36	1.0	.500E+00	.05
.14	.00	.57	1.9	.268E+00	.08
.29	.00	.76	3.2	.157E+00	.11
.45	.00	.94	4.8	.104E+00	.14
.62	.00	1.12	6.8	.738E-01	.17
.80	.00	1.28	9.0	.556E-01	.20
.98	.00	1.44	11.5	.436E-01	.23
1.17	.00	1.59	14.2	.351E-01	.26
1.37	.00	1.74	17.2	.291E-01	.29
1.56	.00	1.88	20.4	.245E-01	.32
1.76	.00	2.02	23.8	.210E-01	.35
1.97	.00	2.15	27.4	.182E-01	.38
2.17	.00	2.28	31.2	.160E-01	.41
2.38	.00	2.41	35.1	.142E-01	.44
2.59	.00	2.54	39.3	.127E-01	.46
2.80	.00	2.66	43.6	.115E-01	.49
3.01	.00	2.77	48.1	.104E-01	.52
3.22	.00	2.89	52.7	.948E-02	.54
3.44	.00	3.01	57.5	.870E-02	.57
3.65	.00	3.12	62.4	.802E-02	.60
3.87	.00	3.23	67.4	.742E-02	.62
4.08	.00	3.34	72.6	.689E-02	.65
4.30	.00	3.45	77.9	.642E-02	.67
4.52	.00	3.55	83.3	.600E-02	.70
4.74	.00	3.66	88.9	.562E-02	.72

4.96	.00	3.76	94.6	.529E-02	.75
5.18	.00	3.86	100.3	.498E-02	.77
5.40	.00	3.96	106.3	.471E-02	.79
5.62	.00	4.06	112.2	.445E-02	.82
5.85	.00	4.16	118.3	.423E-02	.84
6.07	.00	4.25	124.5	.402E-02	.86
6.29	.00	4.35	130.9	.382E-02	.89
6.52	.00	4.44	137.3	.364E-02	.91
6.74	.00	4.54	143.7	.348E-02	.93
6.97	.00	4.63	150.4	.332E-02	.96
7.19	.00	4.72	157.1	.318E-02	.98
7.41	.00	4.81	163.8	.305E-02	1.00
7.64	.00	4.90	170.7	.293E-02	1.02
7.87	.00	4.99	177.7	.281E-02	1.04
8.09	.00	5.08	184.7	.271E-02	1.07
8.32	.00	5.16	191.8	.261E-02	1.09
8.55	.00	5.25	199.1	.251E-02	1.11
8.77	.00	5.34	206.3	.242E-02	1.13
9.00	.00	5.42	213.7	.234E-02	1.15
9.23	.00	5.51	221.1	.226E-02	1.17
9.46	.00	5.59	228.7	.219E-02	1.19
9.68	.00	5.68	236.2	.212E-02	1.21
9.91	.00	5.76	243.9	.205E-02	1.23
10.14	.00	5.84	251.7	.199E-02	1.26
10.37	.00	5.92	259.5	.193E-02	1.28
10.60	.00	6.00	267.3	.187E-02	1.30

Cumulative travel time = 140. sec

END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

BEGIN MOD131: LAYER BOUNDARY/TERMINAL LAYER APPROACH

Control volume inflow:

X	Y	Z	S	C	B
10.60	.00	6.00	267.3	.187E-02	1.30

Profile definitions:

BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH	ZU	ZL	
9.30	.00	7.30	267.3	.187E-02	.00	.00	7.30	7.30	
9.69	.00	7.30	267.3	.187E-02	1.70	.85	7.30	5.60	
10.08	.00	7.30	267.3	.187E-02	2.01	1.21	7.30	5.29	
10.47	.00	7.30	267.3	.187E-02	2.21	1.48	7.30	5.09	
10.86	.00	7.30	274.7	.182E-02	2.36	1.71	7.30	4.94	
11.24	.00	7.30	308.7	.162E-02	2.47	1.91	7.30	4.83	
11.63	.00	7.30	355.8	.141E-02	2.56	2.09	7.30	4.74	

12.02	.00	7.30	398.6	.125E-02	2.62	2.26	7.30	4.68
12.41	.00	7.30	428.1	.117E-02	2.66	2.41	7.30	4.64
12.80	.00	7.30	444.0	.113E-02	2.69	2.56	7.30	4.61
13.19	.00	7.30	454.4	.110E-02	2.70	2.70	7.30	4.60

Cumulative travel time = 192. sec

END OF MOD131: LAYER BOUNDARY/TERMINAL LAYER APPROACH

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD141: BUOYANT AMBIENT SPREADING

Profile definitions:
BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
13.19	.00	7.30	454.4	.110E-02	2.70	2.70	7.30	4.60
21.59	.00	7.30	519.9	.962E-03	1.81	4.59	7.30	5.49
30.00	.00	7.30	560.9	.891E-03	1.46	6.14	7.30	5.84
38.41	.00	7.30	592.6	.844E-03	1.26	7.52	7.30	6.04
46.81	.00	7.30	619.7	.807E-03	1.13	8.78	7.30	6.17
55.22	.00	7.30	644.4	.776E-03	1.04	9.96	7.30	6.26
63.62	.00	7.30	667.7	.749E-03	.97	11.06	7.30	6.33
72.03	.00	7.30	690.5	.724E-03	.91	12.12	7.30	6.39
80.44	.00	7.30	713.3	.701E-03	.87	13.13	7.30	6.43
88.84	.00	7.30	736.3	.679E-03	.84	14.10	7.30	6.46
97.25	.00	7.30	759.9	.658E-03	.81	15.04	7.30	6.49
105.65	.00	7.30	784.4	.637E-03	.79	15.95	7.30	6.51
114.06	.00	7.30	809.7	.617E-03	.77	16.83	7.30	6.53
122.47	.00	7.30	836.2	.598E-03	.76	17.69	7.30	6.54
130.87	.00	7.30	864.0	.579E-03	.75	18.53	7.30	6.55
139.28	.00	7.30	893.0	.560E-03	.74	19.36	7.30	6.56
147.68	.00	7.30	923.5	.541E-03	.73	20.16	7.30	6.57
156.09	.00	7.30	955.5	.523E-03	.73	20.95	7.30	6.57
164.50	.00	7.30	989.0	.506E-03	.73	21.72	7.30	6.57
172.90	.00	7.30	1024.2	.488E-03	.73	22.48	7.30	6.57
181.31	.00	7.30	1061.1	.471E-03	.73	23.23	7.30	6.57
189.71	.00	7.30	1099.8	.455E-03	.73	23.96	7.30	6.57
198.12	.00	7.30	1140.3	.438E-03	.74	24.68	7.30	6.56
206.53	.00	7.30	1182.6	.423E-03	.75	25.40	7.30	6.55
214.93	.00	7.30	1226.9	.408E-03	.75	26.10	7.30	6.55
223.34	.00	7.30	1273.1	.393E-03	.76	26.79	7.30	6.54
231.74	.00	7.30	1321.2	.378E-03	.77	27.47	7.30	6.53
240.15	.00	7.30	1371.4	.365E-03	.78	28.15	7.30	6.52
248.55	.00	7.30	1423.7	.351E-03	.79	28.82	7.30	6.51
256.96	.00	7.30	1478.1	.338E-03	.80	29.48	7.30	6.50
265.37	.00	7.30	1534.6	.326E-03	.81	30.13	7.30	6.49

273.77	.00	7.30	1593.2	.314E-03	.83	30.77	7.30	6.47
282.18	.00	7.30	1654.1	.302E-03	.84	31.41	7.30	6.46
290.58	.00	7.30	1717.2	.291E-03	.86	32.05	7.30	6.44
298.99	.00	7.30	1782.5	.281E-03	.87	32.67	7.30	6.43
307.40	.00	7.30	1850.1	.270E-03	.89	33.29	7.30	6.41
315.80	.00	7.30	1920.0	.260E-03	.91	33.91	7.30	6.39
324.21	.00	7.30	1992.3	.251E-03	.92	34.51	7.30	6.38
332.61	.00	7.30	2066.9	.242E-03	.94	35.12	7.30	6.36
341.02	.00	7.30	2143.9	.233E-03	.96	35.72	7.30	6.34
349.43	.00	7.30	2223.4	.225E-03	.98	36.31	7.30	6.32
357.83	.00	7.30	2305.2	.217E-03	1.00	36.90	7.30	6.30
366.24	.00	7.30	2389.5	.209E-03	1.02	37.48	7.30	6.28
374.64	.00	7.30	2476.3	.202E-03	1.04	38.06	7.30	6.26
383.05	.00	7.30	2565.7	.195E-03	1.06	38.64	7.30	6.24
391.46	.00	7.30	2657.5	.188E-03	1.08	39.21	7.30	6.22
399.86	.00	7.30	2751.9	.182E-03	1.11	39.77	7.30	6.19
408.27	.00	7.30	2848.8	.176E-03	1.13	40.34	7.30	6.17
416.67	.00	7.30	2948.4	.170E-03	1.15	40.90	7.30	6.15
425.08	.00	7.30	3050.5	.164E-03	1.18	41.45	7.30	6.12
433.49	.00	7.30	3155.3	.158E-03	1.20	42.00	7.30	6.10

Cumulative travel time = 8598. sec

Plume is ATTACHED to LEFT bank/shore.
Plume width is now determined from LEFT bank/shore.

Plume Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL	
433.49	42.00	7.30	3155.3	.158E-03	1.20	84.00	7.30	6.10	
444.82	42.00	7.30	3292.5	.152E-03	1.24	84.73	7.30	6.06	
456.15	42.00	7.30	3432.2	.146E-03	1.29	85.46	7.30	6.01	
467.48	42.00	7.30	3574.4	.140E-03	1.33	86.19	7.30	5.97	
478.81	42.00	7.30	3719.0	.134E-03	1.37	86.91	7.30	5.93	
490.14	42.00	7.30	3866.2	.129E-03	1.41	87.63	7.30	5.89	
501.47	42.00	7.30	4015.9	.125E-03	1.45	88.35	7.30	5.85	
512.80	42.00	7.30	4168.1	.120E-03	1.50	89.06	7.30	5.80	
524.13	42.00	7.30	4322.8	.116E-03	1.54	89.78	7.30	5.76	
535.46	42.00	7.30	4480.1	.112E-03	1.58	90.49	7.30	5.72	
546.79	42.00	7.30	4640.0	.108E-03	1.63	91.19	7.30	5.67	
558.12	42.00	7.30	4802.4	.104E-03	1.67	91.90	7.30	5.63	
569.45	42.00	7.30	4967.4	.101E-03	1.72	92.60	7.30	5.58	
580.78	42.00	7.30	5135.0	.974E-04	1.76	93.30	7.30	5.54	
592.11	42.00	7.30	5305.2	.942E-04	1.81	94.00	7.30	5.49	
603.44	42.00	7.30	5477.9	.913E-04	1.85	94.70	7.30	5.45	
614.77	42.00	7.30	5653.3	.884E-04	1.90	95.39	7.30	5.40	
626.10	42.00	7.30	5831.4	.857E-04	1.94	96.08	7.30	5.36	
637.43	42.00	7.30	6012.0	.832E-04	1.99	96.77	7.30	5.31	
648.76	42.00	7.30	6195.3	.807E-04	2.03	97.45	7.30	5.27	
660.09	42.00	7.30	6381.3	.784E-04	2.08	98.14	7.30	5.22	
671.42	42.00	7.30	6569.9	.761E-04	2.13	98.82	7.30	5.17	
682.75	42.00	7.30	6761.2	.740E-04	2.17	99.50	7.30	5.13	
694.08	42.00	7.30	6955.2	.719E-04	2.22	100.18	7.30	5.08	
705.41	42.00	7.30	7151.8	.699E-04	2.27	100.85	7.30	5.03	

716.74	42.00	7.30	7351.2	.680E-04	2.32	101.53	7.30	4.98
728.07	42.00	7.30	7553.3	.662E-04	2.36	102.20	7.30	4.94
739.40	42.00	7.30	7758.1	.644E-04	2.41	102.87	7.30	4.89
750.73	42.00	7.30	7965.6	.628E-04	2.46	103.53	7.30	4.84
762.06	42.00	7.30	8175.8	.612E-04	2.51	104.20	7.30	4.79
773.39	42.00	7.30	8388.8	.596E-04	2.56	104.86	7.30	4.74
784.73	42.00	7.30	8604.6	.581E-04	2.61	105.52	7.30	4.69
796.06	42.00	7.30	8823.1	.567E-04	2.66	106.18	7.30	4.64
807.39	42.00	7.30	9044.4	.553E-04	2.71	106.84	7.30	4.59
818.72	42.00	7.30	9268.5	.539E-04	2.76	107.49	7.30	4.54
830.05	42.00	7.30	9495.3	.527E-04	2.81	108.15	7.30	4.49
841.38	42.00	7.30	9725.0	.514E-04	2.86	108.80	7.30	4.44
852.71	42.00	7.30	9957.5	.502E-04	2.91	109.45	7.30	4.39
864.04	42.00	7.30	10192.7	.491E-04	2.96	110.09	7.30	4.34
875.37	42.00	7.30	10430.8	.479E-04	3.01	110.74	7.30	4.29
886.70	42.00	7.30	10671.7	.469E-04	3.07	111.38	7.30	4.23
898.03	42.00	7.30	10915.5	.458E-04	3.12	112.03	7.30	4.18
909.36	42.00	7.30	11162.1	.448E-04	3.17	112.67	7.30	4.13
920.69	42.00	7.30	11411.6	.438E-04	3.22	113.31	7.30	4.08
932.02	42.00	7.30	11663.9	.429E-04	3.28	113.94	7.30	4.02
943.35	42.00	7.30	11919.1	.419E-04	3.33	114.58	7.30	3.97
954.68	42.00	7.30	12177.2	.411E-04	3.38	115.21	7.30	3.92
966.01	42.00	7.30	12438.2	.402E-04	3.44	115.85	7.30	3.86
977.34	42.00	7.30	12702.0	.394E-04	3.49	116.48	7.30	3.81
988.67	42.00	7.30	12968.8	.386E-04	3.54	117.10	7.30	3.76
1000.00	42.00	7.30	13238.5	.378E-04	3.60	117.73	7.30	3.70

Cumulative travel time = 19928. sec

Simulation limit based on maximum specified distance = 1000.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD141: BUOYANT AMBIENT SPREADING

CORMIX1: Submerged Single Port Discharges End of Prediction File

1111111111111111111111111111111111111111111111111111111111111111111111111111111111111111

CORMIX1 PREDICTION FILE:
1111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
CORNELL MIXING ZONE EXPERT SYSTEM
Subsystem CORMIX1: Subsystem version:
Submerged Single Port Discharges CORMIX_v.3.20_____September_1996

CASE DESCRIPTION
Site name/label: Gould_Island
Design case: Stagnant
FILE NAME: cormix\sim\FINAL1 .cx1
Time of Fortran run: 11/04/02--13:13:31

ENVIRONMENT PARAMETERS (metric units)
Unbounded section
HA = 9.50 HD = 7.30
UA = .000 F = .015 USTAR = .0000E+00
UW = 2.000 UWSTAR= .2198E-02
Uniform density environment
STRCND= U RHOAM = 1024.0000

DISCHARGE PARAMETERS (metric units)
BANK = LEFT DISTB = 42.00
D0 = .102 A0 = .008 H0 = .31
THETA = 90.00 SIGMA = .00
U0 = .197 Q0 = .002 = .1600E-02
RHO0 = 1018.0000 DRHO0 = .6000E+01 GP0 = .5746E-01
C0 = .5000E+00 CUNITS= ppb
IPOLL = 1 KS = .0000E+00 KD = .0000E+00

FLUX VARIABLES (metric units)
Q0 = .1600E-02 M0 = .3158E-03 J0 = .9194E-04 SIGNJ0= 1.0
Associated length scales (meters)
LQ = .09 LM = .25 Lm = 99999.00 Lb = 99999.00
Lmp = 99999.00 Lbp = 99999.00

NON-DIMENSIONAL PARAMETERS
FR0 = 2.58 R = 99999.00

FLOW CLASSIFICATION
1111111111111111111111111111111111111111
1 Flow class (CORMIX1) = V5 1
1 Applicable layer depth HS = 7.30 1
1111111111111111111111111111111111111111

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
C0 = .5000E+00 CUNITS= ppb
NTOX = 0
NSTD = 0
REGMZ = 0
XINT = 1000.00 XMAX = 1000.00

X-Y-Z COORDINATE SYSTEM:

ORIGIN is located at the bottom and below the center of the port:
42.00 m from the LEFT bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 50 display intervals per module

BEGIN MOD101: DISCHARGE MODULE

X	Y	Z	S	C	B
.00	.00	.31	1.0	.500E+00	.05

END OF MOD101: DISCHARGE MODULE

BEGIN CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

Zone of flow establishment: THETAE= 90.00 SIGMAE= .00
LE = .34 XE = .00 YE = .00 ZE = .64

Profile definitions:
B = Gaussian 1/e (37%) half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	B
.00	.00	.31	1.0	.500E+00	.05
.00	.00	.64	1.0	.500E+00	.05
.00	.00	.76	1.2	.422E+00	.06
.00	.00	.88	1.6	.316E+00	.07
.00	.00	1.00	2.0	.248E+00	.09
.00	.00	1.12	2.5	.200E+00	.10
.00	.00	1.25	3.0	.165E+00	.11
.00	.00	1.36	3.6	.139E+00	.12
.00	.00	1.48	4.2	.119E+00	.13
.00	.00	1.61	4.8	.103E+00	.15
.00	.00	1.72	5.5	.910E-01	.16
.00	.00	1.85	6.2	.805E-01	.17
.00	.00	1.97	7.0	.719E-01	.18
.00	.00	2.08	7.7	.648E-01	.19
.00	.00	2.21	8.5	.586E-01	.21
.00	.00	2.33	9.4	.533E-01	.22
.00	.00	2.45	10.2	.489E-01	.23
.00	.00	2.57	11.1	.449E-01	.24
.00	.00	2.69	12.1	.414E-01	.25
.00	.00	2.81	13.0	.384E-01	.27
.00	.00	2.93	14.0	.357E-01	.28
.00	.00	3.05	15.0	.333E-01	.29
.00	.00	3.17	16.1	.311E-01	.30
.00	.00	3.29	17.2	.292E-01	.31
.00	.00	3.41	18.2	.274E-01	.32
.00	.00	3.53	19.4	.258E-01	.34
.00	.00	3.65	20.5	.243E-01	.35

.00	.00	3.77	21.7	.230E-01	.36
.00	.00	3.89	22.9	.218E-01	.37
.00	.00	4.01	24.2	.207E-01	.38
.00	.00	4.13	25.4	.197E-01	.40
.00	.00	4.25	26.7	.187E-01	.41
.00	.00	4.37	28.0	.178E-01	.42
.00	.00	4.49	29.3	.170E-01	.43
.00	.00	4.61	30.7	.163E-01	.44
.00	.00	4.73	32.1	.156E-01	.46
.00	.00	4.85	33.5	.149E-01	.47
.00	.00	4.97	34.9	.143E-01	.48
.00	.00	5.09	36.4	.137E-01	.49
.00	.00	5.21	37.9	.132E-01	.50
.00	.00	5.33	39.4	.127E-01	.52
.00	.00	5.45	40.9	.122E-01	.53
.00	.00	5.57	42.4	.118E-01	.54
.00	.00	5.69	44.0	.114E-01	.55
.00	.00	5.81	45.6	.110E-01	.56
.00	.00	5.93	47.2	.106E-01	.57
.00	.00	6.05	48.9	.102E-01	.59
.00	.00	6.17	50.5	.989E-02	.60
.00	.00	6.29	52.2	.957E-02	.61
.00	.00	6.41	54.0	.927E-02	.62
.00	.00	6.53	55.7	.898E-02	.63
.00	.00	6.65	57.4	.871E-02	.65

Cumulative travel time = 40. sec

END OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

BEGIN MOD132: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

Vertical angle of layer/boundary impingement = 90.00 deg
Horizontal angle of layer/boundary impingement = .00 deg

Discharge into STAGNANT AMBIENT environment:
STEADY-STATE MIXING CONDITION IS NOT POSSIBLE in this zone,
even though some ADDITIONAL DILUTION MAY OCCUR!
Also, all far-field processes will be UNSTEADY.
SIMULATION STOPS because of stagnant ambient conditions.

END OF MOD132: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

** End of NEAR-FIELD REGION (NFR) **

SIMULATION STOPS because of STAGNANT AMBIENT conditions.
All far-field processes will be UNSTEADY.

CORMIX1: Submerged Single Port Discharges End of Prediction File
11111111111111111111111111111111111111111111111111111111111111111111111111111